The Intersection of Opioids and Hepatitis C Virus in a Rural Pennsylvania County – Improvements in Policy

by

Cheyenne Annarumo

BS, Gannon University, 2018

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This essay is submitted

by

Cheyenne Annarumo

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and approved by

Essay Advisor:
Linda Rose Frank, PhD, MSN, CS, ACRN, FAAN
Professor of Public Health, Medicine, and Nursing
Infectious Diseases and Microbiology
Graduate School of Public Health
University of Pittsburgh

Essay Reader:
Brenda Diergaarde, PhD
Associate Professor of Human Genetics
Graduate School of Public Health
University of Pittsburgh

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Cheyenne Annarumo, MPH

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Abstract

Problem: In 2016, the CDC released a report outlining the high vulnerability of particular counties to widespread dissemination of Human Immunodeficiency virus and Hepatitis C virus (HCV) infections among people who inject drugs. This report included Crawford County, a rural area in Pennsylvania where the opioid epidemic and injection drug use are becoming increasingly prominent. Rural Americans experience disparities in access to care, availability of drug treatment resources, and availability and access to syringe exchange programs. Many of these disparities are rooted in a lack of policy and/or outdated policies related to injection drug prevention and treatment. This essay's public health significance is to understand the intersection of HCV and opioids in Crawford County and to provide ideas for strategies that will help resolve this public health challenge.

Methods: A policy analysis was completed to examine the current situation in Crawford County regarding the need for treatment and prevention of opioid use and related HCV infections. Pennsylvania state related policies on opioid use, monitoring, prevention and treatment were examined. A summary of key literature related to opioid use and HCV, and a review of the current policies were used to develop recommendations for changes in policies related to opioid use and HCV prevention and treatment.

Results: Currently policies in Pennsylvania and in the United States as a whole have played an important role in reducing HCV transmission through injection drug use. These policies include

opioid prescribing and dispensing guidelines, the implementation of the Pennsylvania Prescription Drug Monitoring Program, allotment of a portion of the state's budget to address the opioid epidemic, and the HCV treatment action plan introduced by the United States Department of Health and Human Services. Nevertheless, HCV and injection drug use rates are still alarmingly high in Crawford County and additional policy improvements are needed. **Conclusion:** The linkage of patients to care, development of new programs, allocation of addition resources to at-risk counites, providing the opportunity for alternatives to incarceration for drug offenses and providing trainings and education services to providers and communities are promising and important changes that would decrease HCV transmission through injection drug use.

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List of Abbreviations

AASLD.....American Association for the Study of Liver Disease

CCDAEC.....Crawford County Drug and Alcohol Executive Commission

CDC.....Centers for Disease Control and Prevention

DDAP.....Department of Drug and Alcohol Programs

DEA.....Drug Enforcement Administration

DHS.....Department of Human Services

DOH.....Department of Health

EMS.....Emergency Medical Services

FDA.....Federal Drug Administration

FQHC.....Federally Qualified Health Centers

HAT.....Heroin Assisted Treatment

HCV……...Hepatitis C Virus

HCW.....Healthcare Workers

DHHS.....Department of Health and Human Services

HIV……Human Immunodeficiency Virus

IDSA.....Infectious Diseases Society of America

IFN.....Interferon

MAT.....Medication-Assisted Treatment

MCOs.....Managed Care Organizations

MSM.....Men who have sex with men

NCCC.....National Clinical Consultation Center

NIH.....National Institutes of Health

NNDSS.....National Notifiable Disease Surveillance System

NSP.....Needle and Syringe Programs

NWPA.....North Western Pennsylvania

OUD.....Opioid Use Disorder

PA.....Pennsylvania

PCCD.....Pennsylvania Commission of Crime and Delinquency

PDMPs.....Prescription Drug Monitoring Programs

PrEP.....Preexposure Prophylaxis

PWID.....People Who Inject Drugs

SBIRT.....Screening, Brief Intervention and Referral to Treatment

STIs.....Sexually Transmitted Infections

USPSTF.....United States Preventative Services Task Force

US.....…….....United States

VA…….....Veterans Administration

WHO.....World Health Organization

Preface

My essay advisor and committee chair, Dr. Frank, helped me immensely in the development of this analysis and I would like to thank her for her guidance and assistance. I would also like to extend gratitude to Dr. Diergaarde for her continued support and assistance throughout this process. I would also like to express my appreciation for the opportunity to work with the HRSA-funded, MidAtlantic AIDS Education and Training Center at the University of Pittsburgh, Graduate School of Public Health to complete this project.

1.0 Introduction

There is currently an opioid epidemic in the United States (US) which is defined as the increasing number of hospitalizations and deaths due to opioid use (Gostin, Hodge, and Noe, 2017). An additional issue related to the increase in injection opioid use is the increase in reported Hepatitis C virus (HCV) cases (Van Handel et al., 2018). There are multiple avenues to ingest opioids. People who inject opioids as their method of use are of high importance to public health professionals due to increased risk of transmitting infectious diseases. In 2016, the Centers for Disease Control and Prevention (CDC) released a report indicating the counties that had high vulnerability to widespread dissemination of Human Immunodeficiency Virus (HIV) and/or HCV infection among persons who inject drugs (Van Handel et al., 2018). Three Pennsylvanian counties were listed and found to be highly vulnerable: Luzerne, Cambria, and Crawford. These three counties are in rural areas where the opioid epidemic and injection drug use have become increasingly prominent, which puts county residents at an increased risk of infection with HCV. Figure 1 indicates the top 220 counties in the US outlined on the CDC's most vulnerable counties list (Opioid and Health Indicators Database, 2019).

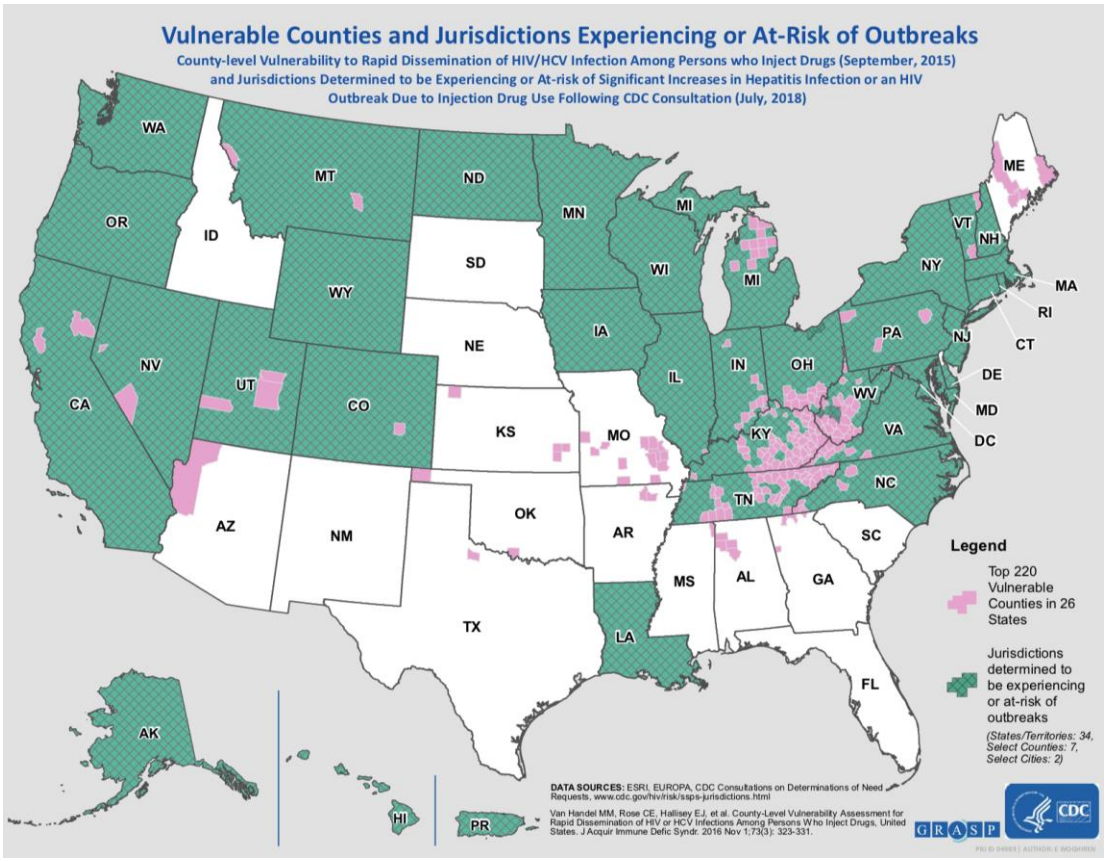


Figure 1. US Counties with the Highest Vulnerability Levels to Widespread Disssemination of HIV and HCV in 2016
("Vulnerable Counties and Jurisdictions Experiencing or At-Risk of Outbreaks", 2018)

HCV infection is one of the harmful consequences of injection drug use. It has been documented that 1 out of 3 individuals who inject drugs acquire HCV within the first year of injecting (Van Handel et al., 2018). While people who inject drugs (PWID) all over the country are impacted by the consequences of injection drug use, injection drug users living in rural areas experience a particular set of barriers due to specific circumstances in these areas. Individuals living in rural areas experience disparities in access to care, availability of drug treatment resources and availability and access to needle/syringe exchange programs due to factors such as poverty, lack of transportation, lower education levels, health illiteracy, and high rates of unemployment (Schranz et al., 2018). Many of these inequalities and disparities are rooted in a

lack of policy and/or outdated policies related to injection drug prevention and treatment and lack of knowledge of current approaches to drug treatment among users, families, health care providers, and communities. Crawford County, Pennsylvania (PA) exemplifies a rural county faced with an increased incidence of HCV, an increased number of injection drug users, and lack of updated policies and resources to address these concerns. This analysis will focus on Crawford County to identify opportunities for improvement in policy regarding HCV and opioids and offer recommendations.

1.1 Description of Crawford County, PA

1.1.1 Demographics

According to the July 1, 2018 census, the population in Crawford County was 85,063 people, and 20.7% of the individuals were under the age of 18 years, and 5.4% were under the age of 5 years (Census Bureau QuickFacts, 2018). Crawford County has a larger aging population when compared to the United States population: 20.6% of individuals in Crawford County are 65 years of age or older, while only 15.8% of the total population in the United States is over the age of 65 years (Fred.stlouisfed.org, 2019). Racial diversity is limited in Crawford County where 95.8% of individuals identify as white and only 2.0% identify as black or African American. The remaining 2.2% is comprised of individuals who identify a different race including Asian, Hispanic or Latino/Latina, or individuals who identify as mixed race (Census Bureau QuickFacts, 2018). Regarding education, 88.3% of Crawford County residents have at least a high school diploma but only 20.4% of those residents have received a bachelor's degree or higher (Census Bureau QuickFacts, 2018).

Sociocultural factors such as high poverty and unemployment rates as well as the lack of access to transportation have a major impact on the healthcare of individuals everywhere. However, there are several social determinants of health directly affecting people in rural areas. Racial minorities, particularly African Americans, and men who have sex with men (MSM) are at a higher risk of contracting sexually transmitted infections (STIs). Individuals of racial and sexual/gender minorities are less likely to utilize healthcare services and resources when they do not feel welcome in the community leading to a large barrier to care (James et al., 2017). Individuals with substance use disorders often avoid seeking medical care for fear that their care will be terminated for abusing drugs or other risky behaviors (Schranz et al., 2018).

These various factors all have an impact on an individuals' health and many greatly influence the subsequent disparities. Low levels of higher education lead to decreased rates of health literacy in rural areas, which is a key issue in Crawford County. If individuals do not fully understand the services they are being offered, they are less likely to trust healthcare professionals (Schranz et al., 2018). Furthermore, when there is a lack of trust in the healthcare system, individuals will not seek out services (Schranz et al., 2018).

1.1.2 Health

Comorbidities, multiple health conditions that ultimately lead to death, have higher age-adjusted rates in Crawford County compared to Pennsylvania as a whole (Health.pa.gov, 2017). These conditions include heart disease, influenza and pneumonia, chronic lower respiratory diseases, cerebrovascular diseases, colon and rectum cancer in females only, and Alzheimer's disease (Table 1) (Health.pa.gov, 2017). Incidence rates of campylobacteria and salmonellosis are also higher in Crawford County compared to Pennsylvania as a whole, while the incidence

rates of chlamydia, gonorrhea, Lyme disease, and pertussis are lower in Crawford County than in the rest of Pennsylvania (Table 2) (Health.pa.gov, 2017). As for adult behavioral health risk factors, the percentage of individuals who currently smoke cigarettes, are overweight, or obese, and have arthritis are higher in Crawford County than in Pennsylvania as whole (Table 3) (Health.pa.gov, 2017).

Table 1. Age-Adjusted Rates of Selected Causes of Death, 2013 - 2017

Measure	Crawford County	Interval (95%)	Pennsylvania
Heart Disease	188.1	(177.2 – 199.0)	176.3
Chronic Lower Respiratory Disease	53.7	(47.9 – 59.4)	37.6
Cerebrovascular Disease	45.7	(40.3 – 51.1)	37.0
Alzheimer Disease	50.2	(44.6 – 55.9)	20.0
Influenza and Pneumonia	20.4	(16.9 – 24.0)	14.8
Colon and Rectum Cancer (Females)	43.5	(36.3 – 51.9)	36.2

Age-adjusted rates, per 100,000 individuals, of causes of death that are higher in Crawford County than in Pennsylvania as a whole in 2013 – 2017 according to the Pennsylvania Department of Health, 2018 (Health.pa.gov, 2017).

Table 2. Incidence Rates of Selected Infectious Diseases, 2015 - 2017

Measure	Crawford County	Interval (95%)	Pennsylvania
Campylobacteria	30.5	(23.8 – 37.2)	19.0
Salmonellosis	17.0	(12.0 – 22.0)	12.5
Chlamydia	208.6	(190.9 – 226.2)	434.6
Gonorrhea	34.8	(27.5 – 42.0)	111.1
Lyme Disease	64.5	(54.7 – 74.3)	85.4
Pertussis	4.2	(1.7 – 6.8)	9.0

Incidence rates, per 100,000 individuals, of selected infectious diseases that significantly differ between Crawford County and Pennsylvania as a whole in 2015 – 2017 according to the Pennsylvania Department of Health, 2018 (Health.pa.gov, 2017).

Table 3. Adult Behavior Risk Factors, 2015 - 2017

Measure	Crawford County	Interval (95%)	Pennsylvania
Percent Current Smoker	24.0	(21.0 – 28.0)	18.0
Percent Overweight	72.0	(68.0 – 76.0)	66.0
Percent Obese	38.0	(34.0 – 42.0)	31.0
Percent Ever Told They Have Arthritis	36.0	(32.0 – 40.0)	30.0

Percentage of select risk behaviors/factors that are higher in Crawford County than in Pennsylvania as a whole in 2015 – 2017 according to the Pennsylvania Department of Health, 2018 (Health.pa.gov, 2017).

1.1.3 Economy and Employment

The current state of the economy in Crawford County is depressed in comparison to the US as a whole. The unemployment rate in Crawford County is 4.6%, which is 0.6% higher than

the national average, partially as a result of the declining job market in Crawford County which has decreased 0.9% over the past year (Workstats.dli.pa.gov, 2019). The future job growth for the US is projected to be 33.5% while the projected future job growth for Crawford County is only 12.6% (Workstats.dli.pa.gov, 2019). In 2017, the median household income for Crawford County was $47,179 while the average income per individual in 2017 was $24,716. Due to the higher unemployment rate, low household income levels and decreasing job market, the poverty rate in Crawford County in 2017 was 14.6% and is continuing to grow (Census Bureau QuickFacts, 2018). The poverty rate of Crawford County is higher in comparison to the poverty rate of Pennsylvania as a whole, which is 12.2% (Census Bureau QuickFacts, 2019). The lack of higher education leads to higher rates of unemployment, and with insufficient job opportunities in Crawford County individuals living in poverty impacts their ability to afford medical care, medications, transportation, housing, or other basic living needs (Schranz et al., 2018).

1.1.4 Public Transportation and Access to Healthcare Providers

Public transportation is almost nonexistent in Crawford County (Cityofmeadville.org, n.d.). Buses are available in certain areas but have limited routes and are predominantly in the most populous areas in Crawford County, such as Meadville. Transits such as Lyft, Uber, and Taxi services are available, however, they are scarce and expensive. Lack of transportation is an impeding factor for residents of rural areas, or individuals living in poverty who cannot afford a vehicle, as they have no means of getting to their medical appointments. Due to this, accessing any healthcare services outside of walking distance is extremely difficult.

Individuals with disabilities are able to utilize a van service that will transport them to their medical appointments (J. Tompkins, personal communication, October 30, 2019). This

service is covered by most insurance companies, but it is very expensive to pay for otherwise. This results in disabled individuals without health insurance being at a detrimental disadvantage. In Crawford County, 8.0% of individuals are without health insurance and 12.4% of individuals have disabilities (Census Bureau QuickFacts, 2018). Both the rate of individuals without health insurance and individuals with disabilities is higher in Crawford County than in Pennsylvania as a whole. In Pennsylvania, 6.7% of individuals are without health insurance and 9.6 % of individuals have disabilities (Census Bureau QuickFacts, 2018).

Veterans also have access to the van transportation service for medical appointments and transportation to the veteran's administration (VA) clinic located in Crawford County. The veteran population in Crawford County is 7.8%, which is 1.5% high than the veteran population in Pennsylvania as a whole. (Census Bureau QuickFacts, 2018); (Census Bureau QuickFacts, 2019). With the population of veterans being relatively low, there is not a VA specific medical center in Crawford County. If a veteran wanted to go to a VA specific medical center they would have to find transportation to Erie County.

1.2 The Opioid Epidemic

While opioid use and misuse has been an ongoing issue in the United States for more than a century, the current opioid epidemic came about in the 1980s and 1990s with the dissemination of synthetic and semi-synthetic opioids by pharmaceutical companies. Although opioids are prescribed for pain management, they are associated with a stark increase in the rate of opioid misuse, overdose, and death (Wilkerson et al., 2016).

Throughout the early 20th century medical professionals avoided prescribing opioids due to the potential for addiction and overdose. The results of a study conducted in 1986 indicated an increased use of opioids for pain management in patients suffering from noncancer-related chronic pain. This retrospective study reported that only 2 out of the 38 patients became addicted after undergoing opioid pain management for noncancer related chronic pain, suggesting that opioids could be a valuable resource for patients seeking pain treatment with low risk of addiction (Portenoy and Foley, 1986).

As the goal to eradicate pain continued, in 1999 the Veterans Health Administration created their pain management movement, "Pain: the 5th Vital Sign" (Mularski, White-Chu, Overbay et al., 2006). This initiative required evaluation and treatment of all pain symptoms at each clinical visit which led to the dramatic increase of opioid prescriptions in clinical settings with the assumption that that addiction and potential overdose were unlikely.

From 1999 to 2017, approximately 218,000 individuals died in the US from an overdose due to prescription opioids. According to the CDC, 46 individuals die each day due to prescription opioid use (Scholl, Kariisa, Wilson, and Baldwin, 2018). Overall, the medical community displayed an extremely slow response to the increase in opioid addiction and overdose rates that occurred as a direct result of the increase in opioid pain medication prescriptions (Wilkerson et al., 2016). Currently, at clinical visits a measure of pain on a scale from 1-10 is recorded. However, utilization of these pains scores are minimal (Wilkerson et al., 2016). In 2017, approximately 17% of individuals in the US had at least one opioid prescription filled, with each having 3.4 refills on average (Scholl, Kariisa, Wilson, and Baldwin, 2018).

Aside from prescription opioids, "street" opioids such as heroin and fentanyl have also played an influential role in the increasing opioid epidemic. A total of 494,000 individuals in the

US report using heroin at least once within the last year (Scholl, Kariisa, Wilson, and Baldwin, 2018). Often when individuals no longer have a prescription for opioids, they have already developed an addiction and turn to "street" opioids. One study indicates that in urban, young injection opioid drug users, 86% used prescription opioids prior to using heroin (Lankenau et al., 2012). In 2017, 15,000 individuals in the US died from a heroin overdose (Scholl, Kariisa, Wilson, and Baldwin, 2018).

China is the main supplier of nonmedical fentanyl to the US, Canada, and Mexico (Howlett et al., 2016). Chinese producers export a variety of products to the US to local cartels to sell such as raw fentanyl, fentanyl precursors, fentanyl analogues, fentanyl-laced counterfeit prescription drugs, and pill presses and other machinery necessary for fentanyl production (Howlett et al., 2016).

1.2.1 Prescription Drug Monitoring and Take-Home Naloxone Programs

While there was an initial delayed response to the stark increase in opioid dependency and related overdoses from the medical community and public, this has changed in recent years due to increased rates and drug-related deaths. The implementation of prescription drug monitoring programs (PDMPs) and take-home naloxone programs were some of the first steps made to address these challenges. Naloxone is an opioid antagonist, which is utilized to combat the effects of an opioid overdose (NIH, 2014).

The introduction of naloxone has had a substantial impact on the care of patients who overdose from opioids. With the rise of the opioid epidemic in the United States the use of naloxone by emergency medical services (EMS) providers has increased. From January 1, 2018 to October 5, 2019 27,219 doses of naloxone have been administered by EMS in the state of

Pennsylvania (Data.pa.gov, 2019). Historically, naloxone has only been used in clinical settings and carried by EMS. However, with the implementation of take-home naloxone programs in different parts of the US in the 1990s, the use of naloxone is now being expanded to nontraditional providers (McDonald and Strang, 2016). Legislation was also passed in Pennsylvania to expand access to naloxone to individuals who struggle with substance use disorders and other individuals in the community such as firefighters, police officers, pharmacies, etc. under "third party prescribing" laws, also known as "good Samaritan" laws ("The Sentencing Project", 2017).

Crawford County has one naloxone distribution center, which is located at the Crawford County State Health Center in Meadville, PA (Health.pa.gov, 2019). In Crawford County all police departments and fire fighters have access to naloxone however, some departments choose not to carry it. As of March 31, 2018, 15 police and firefighter departments carry naloxone (J. Tompkins, personal communication, December 12, 2019). 13 other public organizations in Crawford County also carry naloxone. These public organizations include libraries, the coroner's office, Crawford County Child Youth Services, the local women's shelter, probation officers' offices, juvenile probation officers' offices, one large business in the area and in-home nurses who care for chronically ill patients who are employed by Community Care Network (J. Tompkins, personal communication, December 12, 2019).

PDMPs were implemented as a policy response both under public health and law enforcement authority. A PDMP is a statewide electronic database that monitors all controlled substances prescribed and distributed from all prescribers and pharmacies statewide with the goal of preventing the over prescription of controlled substances, prescription opioid misuse and protecting the health and safety of the community (Soelberg et al., 2017). Pennsylvania was one

of the last states to launch a PDMP database available to medical professionals. However, as of August 25, 2016 medical professionals who are registered to the PDMP database have access to information that can help them make informed decisions regarding opioid prescribing. The Pennsylvania PDMP records all drugs classified as federal schedules II – V and allows prescribers, pharmacies, law enforcement, licensing boards, and patients to request individual patient information (Soelberg et al., 2017).

The federal Controlled Substance Act of 1970 classified drugs into different groups based on their likelihood for misuse (Tran et al., 2017). Different variants of opioids are classified as different schedules. Schedule I drugs have no medical use and would never be prescribed by a clinician and they have the potential to be high levels of abuse. Heroin is an example of a schedule I opioid. Schedule II drugs also have high potential for misuse, but less than schedule I drugs, and are often used in medical pain management in the US (Soelberg et al., 2017). Opiates are classified as schedule II-controlled substances and are derived from natural opium. Derivatives of opioids include morphine and synthetic morphine derivatives such as oxycodone, hydrocodone, fentanyl, methadone, and codeine (Pdmpassist.org, n.d.). There are no opioids or opioid derivatives listed on schedules III through V. It is important to note that drug addiction typically exists with many different coexisting factors such as poverty, homelessness, marginalization, dual diagnosis, incarceration and medical stigmatization (Bruggmann and Litwin, 2013).

1.2.2 Opioid Treatment

There have been several substance use disorder treatment approaches found to be successful in the reduction of substance use and misuse in PWID. It is important to note that each

individual is unique and there is no one universal treatment strategy that is beneficial to every individual with a substance use disorder. Medication-assisted treatment (MAT) combines the use of medication with counseling and behavioral therapies to counteract the changes that occur in the brain of individuals with substance use disorders (CDC, 2018). For physicians and advanced practice clinicians that are outside of traditionally federally qualified treatment programs to be able to prescribe the medications used in MAT they must apply for a waiver from the Drug Enforcement Administration (DEA) (CDC, 2018). MAT effectiveness varies by study. Some studies indicate effectiveness as low as 20% while others report up to 70% effectiveness (Dennis et al., 2014). Randomized controlled trials conducted in prisons to determine the effectiveness of MATs resulted in increased community treatment engagement within the prisons, reduced illicit drug use, and reduced injection drug use. However, there was no change in the rate of relapse (Moore et al., 2019).

Methadone is the traditional medication used in MAT, but there are alternative medications used as well. Heroin-assisted treatment (HAT) is a more controversial route of MAT. During HAT, the active ingredient in heroin is injected into patients (Moore et al., 2019). Although disputed, HAT has been found to be more effective than oral MAT in both reduction of illicit drug use (67.0% to 47.7%) and increase in retention to treatment (87.8% to 54.1%) (Moore et al., 2019).

Naltrexone is a different option for MAT that inhibits the euphoric effects caused by opioid drug use (Moore et al., 2019). A randomized controlled trial found that 50% of individuals in the trial who received naltrexone as opposed to the placebo did not use illicit drugs and remained on treatment during the duration of the experiment (Moore et al., 2019). The

positive outcome of this study led to the Federal Drug Administration (FDA) approval of naltrexone (Moore et al., 2019).

Buprenorphine is also commonly used in MAT programs and is often paired with naloxone for MAT programs. Buprenorphine has been proven to have very similar effects to methadone regarding the reduction of illicit drug use (NIH, 2018). A randomized controlled trial was performed to compare the success of treatment in a buprenorphine group and a placebo group both comprised of individuals with substance use disorders. The results indicated that the treatment failure rate of the placebo group was 100% while the treatment failure rate of the buprenorphine group was 25% (NIH, 2018).

Vivitrol is an extended-release version of naloxone (NIH, 2014). Vivitrol is an injectable MAT that only requires a patient receive a dose once monthly as opposed to the daily doses of the other MAT medications (NIH, 2014). A randomized controlled trial tested the effectiveness of extended-release naloxone by comparing an extended-release naloxone treatment group to a detoxification with no MAT group. The trail resulted in a lower rate of relapse in the extended-release naloxone group (43%) than the detoxification group (67%) (Lee et al., 2016). Although MAT programs have been found effective in various studies, there is still no definitive conclusion as to which medication is the most effective (Moore et al., 2019).

Traditional detoxification, with no MAT, has been found to be less effective some individuals for substance use disorder treatment than MAT. A study was conducted in a prison where 114 incarcerated substance users were provided methadone-assisted treatment while 109 incarcerated individuals were provided no opioid treatment and were left with the traditional prison opioid use disorder technique, forced withdraw (Rich et al., 2015). The individuals in the methadone-assisted treatment were more likely to continue treatment within one month of being

released from prison (Rich et al., 2015). 96% of individuals from the methadone-assisted treatment group continued treatment upon release while only 78% individuals from the forced withdraw group began treatment after being released (Rich et al., 2015). However, detoxification is an effective means of substance use disorder treatment for some substance users, as indicated by the 78% of substance users that sought out treatment after being released from prison. Detoxification is more effective when coupled with group and/or individual counseling, motivational interviewing, and/or twelve step rehabilitation programs (Vederhus et al., 2014).

Persons with substance use disorders do not rely solely on community-based treatment programs. In recent years, there has been an increase in emergency department utilization for treatment services among substance users. Of the 136 million emergency room visits in the US in 2009, 45.1% were related to substance use disorders (Cederbaum et al., 2014). The 4.6 million individuals with substance use disorders that sought out substance use treatment in a hospital emergency department received care such as hospital detoxification, treatment for non-viral medical conditions associated with chronic injection drug use such as collapsed veins, bacterial infections of the heart valves and blood vessels, abscesses and soft tissues infections, and mental health counseling services (Cederbaum et al., 2014); (NIH, 2018). Patients with substance use disorders were frequently offered referrals to inpatient and outpatient rehabilitation programs and provided educational materials regarding substance use and misuse (Cederbaum et al., 2014). Many uninsured or underinsured individuals with substance use disorders chose to go to hospitals for treatment because public hospitals cannot turn away anyone regardless of their insurance status.

1.2.3 Drug Overdose Deaths

From 1999 to 2014 overdose deaths nearly tripled in the US. In 2010, 12.3 per 100,000 individuals died of an overdose, while in 2015, 16.3 per 100,000 died of an overdose (Gray, Coon, and McGlade, 2014). During this time, overdose deaths related to heroin increased 23% from 2014 (10,574 individuals) to 2015 (12,990 individuals) nationwide (Office of National Drug Control Policy, 2016). In 2015, 20.5 million individuals in the US reported having a substance use disorder. Of those individuals, 2 million reported having a prescription opioid use disorder and 591,000 reported having a substance use disorder related to heroin (Bose et al., 2016).

The number of overdose deaths in Pennsylvania increased from 3,383 deaths in 2015 to 4,642 deaths in 2016, a stark 23% increase (Office of National Drug Control Policy, 2016). Of the 3,383 overdose related deaths in 2015, opioids were present in 85% of deaths while 51.6% of deaths were directly due to fentanyl or synthetic, fentanyl-like substances (DEA, 2017). In 2016, Pennsylvania toxicology reports indicated that 45% of the overdoses had a presence of heroin, while 33.2% contained benzodiazepines, and 25% were prescription opioid related (DEA, 2017). The age-adjusted death rate of drug overdose in Pennsylvania increased by 16.9% from 2016 (37.9 per 100,000) to 2017 (44.3 per 100,000) (CDC, 2018). In 2017, Pennsylvania recorded the third highest amount of deaths due to drug overdose in the US (CDC, 2018).

In Crawford County specifically there were 29 drug related deaths and 69.1 opioid prescriptions per 100 individuals in 2017 (Opioid and Health Indicators Database, 2019). There were 107 opioid related deaths in Crawford County between 2015 and 2018, 28 deaths occurring in 2015, 33 deaths in 2016, 24 deaths in 2017, and 22 deaths in 2018 (Overdosefreepa.pitt.edu, 2019).

1.3 Hepatitis C Virus

Hepatitis is defined as inflammation of the liver which is most often caused by a virus (CDC, 2019). There are five different viruses that cause virally transmitted hepatitis classified as types A – E (CDC, 2019). The virus that is responsible for HCV is highly transmittable and frequently occurs as an asymptomatic, acute infection, where 80% of acute cases develop into a chronic infection (CDC, 2019); (Moore et al., 2019). Acute HCV occurs within the first 6 months of an individual being exposed to the virus and can be a short-term illness. However, if acute HCV develops into chronic HCV, it can lead to a life-long illness and, if left untreated, can result in serious health complications such as liver damage, liver cancer, cirrhosis, and death (CDC, 2019). Transmission can occur via direct contact with blood or open wounds with an infected individual. Exposure can also take place when infected individuals who uses injection drugs share needles, other materials used for drug injection (i.e. syringes), or other items that may come into contact with infected blood, such as razors. Although HCV transmission is most common among individuals sharing injection drug equipment with an infected individual, sexual contact is also a possible route of transmission. Additionally, HCV can be transmitted by receiving a tattoo or piercing with a needle previously used on an infected individual. It is important to note that HCV cannot be transmitted via casual contact with an infected person, such as hugging, kissing, sharing food and drink, sneezing, etc. (CDC, 2019).

There are approximately 3.5 million individuals in the US currently who are chronically infected with HCV (AASLD and IDSA, 2019). In 2016, approximately 41,200 new acute cases of HCV were reported in the United States making it the most common chronic bloodborne virus (CDC, 2018). Among those new case reports, 68.6% of individuals reported that they used injection drugs making it the most common chronic bloodborne virus associated with injection

drug use (CDC, 2018). While many new cases are reported each year, many are unidentified or unreported. It is estimated that 45% to 85% of individuals with chronic HCV are unaware of their condition (WHO, 2017). Approximately 20,000 individuals die nationwide each year from liver disease directly resulted from HCV (Natap.org, 2017).

In Pennsylvania specifically, the incidence rate of acute HCV infection per 100,000 subjects increased from 1.0 in 2015 to 1.8 in 2016 (CDC, 2017). In 2015, there were 129 reported new cases of acute HCV in Pennsylvania. In 2016 the number of reported new cases dramatically increased to 225 and remained relatively constant in 2017 with 224 new cases (CDC, 2018). As for the prevalence of chronic HCV in Pennsylvania, according to the CDC's 2013 – 2016 annual averages, there are 95,100 individuals with HCV (950 cases per 100,000 population) (NIDA, 2014).

In Crawford County in 2016 there were 71 confirmed chronic cases of HCV in individuals aged 15 to 34 years which is the highest number of confirmed chronic cases in the past 10 years (Data.pa.gov, 2019). This age group is arguably the most important to examine when it comes to HCV, not only because of the increased transmission due to PWID, but also because these are the ages where acute cases are typically found. Acute HCV cases are extremely hard to confirm because often the symptoms of acute HCV are indistinguishable from symptoms of substance use withdrawal, resulting in many unreported acute cases. As a result of the high amount of missed cases, data surrounding acute HCV could potentially be unreliable.

The CDC recommends HCV screening for individuals if they meet any of the following criteria: current or former PWID, individuals born between 1945 and 1965, recipients of clotting factors made before 1987, recipients of blood transfusions or solid organ transplants prior to July 1992, chronic hemodialysis patients, individuals with known exposure to HCV (i.e. healthcare

workers (HCW) after needle sticks involving HCV positive blood, recipients of blood or organ transplants from individuals who test HCV positive, etc.), individuals with HIV, and children born to HCV positive mothers (CDC, 2019). The United States Preventative Services Task Force (USPSTF) also recommends screening for individuals who are incarcerated, individuals who use intranasal drugs, and individuals who have ever received an unregulated tattoo (CDC, 2019).

There is currently no vaccination available for HCV, however, it is curable with current medications (Banerjee and Reddy, 2016). Previously, interferons were recommended for individuals with chronic HCV and were usually an effective treatment (Banerjee and Reddy, 2016). However, HCV is now easily curable via a treatment regimen of administering 1 to 3 doses per day, typically for 8 to 12 weeks and has very minimal side effects, such as headache, nausea, fatigue (Banerjee and Reddy, 2016). Direct-acting antivirals are currently used in HCV treatment (FDA, 2019). Medications including Vosevi, Zepatier, and Mavyret can treat all HCV genotypes (FDA, 2019). The cost of treatment varies based on the duration of the treatment and severity of the infection from approximately $19,662 to $23,026 per month (Chung et al., 2018); (Barocas et al., 2018). However, the cost can be greater for more severe cases.

Previous treatment options were a year-long, had extremely severe side effects, were not cost efficient and were not well-received by patients. With the new treatment regimen, more than 95% of patients are cured of HCV (Banerjee and Reddy, 2016). This new effective treatment regimen is critically important for attempting to eradicate HCV as once an individual is cured it is impossible for them to transmit the virus. However, HCV antibodies are not protective and therefore if an individual who has been cured is exposed again, they can be re-infected.

The World Health Organization (WHO) released a global call for the elimination of HCV which states the goal of creating, “A world where viral hepatitis transmission is stopped, and

everyone has access to safe, affordable and effective care." (WHO, 2017). The WHO 2030 targets are to have 90% diagnosed, 80% treated, and 65% mortality reduction (WHO, 2017). This goal is feasible particularly for countries that are motivated to prevent, treat and implement harm reduction efforts, not only for HCV transmission but for opioid use as well (WHO, 2017). For example, Iceland has cured almost all cases of HCV (i.e. approximately 700) and they have found that with the decreased prevalence there is also a decreased new case count (WHO, 2017).

1.3.1 Increase in HCV Infections

The rate of individuals 35 years of age and younger contracting HCV is increasing rapidly due to risky behaviors like injection drug use. One example of a study that demonstrates the rate of HCV diagnosis is higher among individuals with opioid use disorder indicated that opioid misuse increased in the Appalachia region by 21.1% from 2006 – 2016 (Zibbell et al., 2015). Concurrently, 1,377 new HCV cases were recorded in the Appalachia region (Zibbell et al., 2015). An additional study examining opioid use during buprenorphine treatment and the concurrent prevalence of HCV found that 76% of individuals in treatment tested positive for HCV (Murphy, 2015). An unrelated third study indicated the prevalence rate of HCV infection just among PWID aged 40–65 years was 43,126 per 100,000 in 2014 and is continuing to grow (Lansky et al., 2014).

Figure 2 provided by the Pennsylvania Department of Health (DOH), displays the confirmed and probable cases of chronic HCV in Pennsylvania in 2009, while Figure 3 displays the confirmed and probable cases of chronic HCV in Pennsylvania in 2018 (Orkis, 2019). Both graphs are presented in a manner to emphasize the difference of case numbers of chronic HCV in males and females, and the graphs depict the case counts by the age the individual was when the

case was reported. In 2009, the peak in number of cases of chronic HCV is among individuals born in the baby boomer generation for both males and females. There is a second peak of chronic HCV cases among individuals born in the millennial generation[1] and generation X[2] as well, but this peak is approximately half that of the baby boomer generation's peak.

In the years leading up to 2018, the peak of the distribution changed with most HCV-positive cases appearing in the baby boomer generation, to the most HCV-positive cases appearing the millennial and generation X generations. HCV is no longer considered a "baby boomer infection". It is important to note that these peaks represent the beginning of the ongoing opioid epidemic and do not account for all individuals, particularly those in the younger generations whom have not been tested for HCV. This shift in data is attributed to the increasing opioid use rates, and therefore the increased rate of HCV transmission among PWID.

[1]Individuals born between 1981 and 1999 are classified as Millennials (Borges et al., 2006).
[2] Individuals born between 1965 and 1980 are classified as Generation X (Borges et al., 2006).

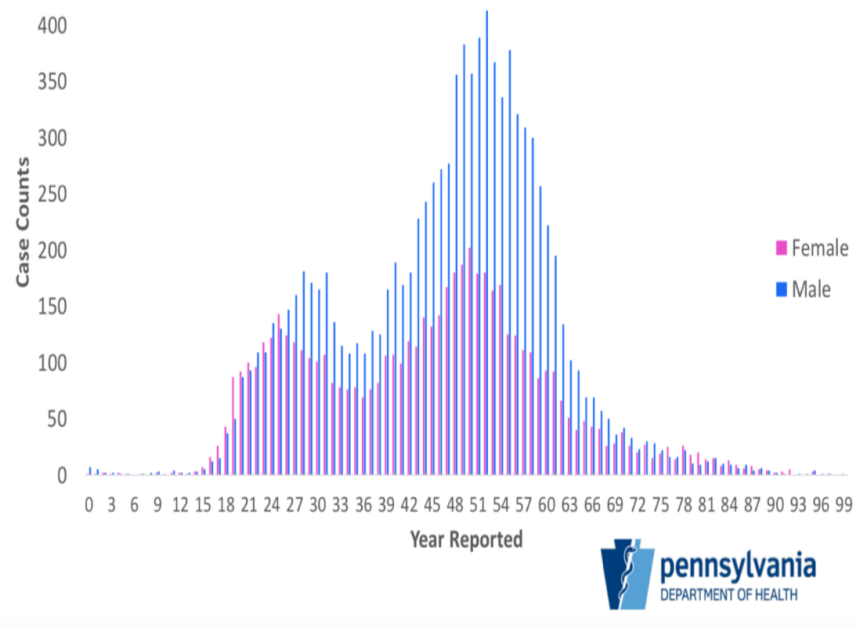


Figure 2. Chronic HCV, Confirmed and Probable Cases, 2009, Pennsylvania
A layered bar graph displaying the chronic HCV confirmed and probable cases in 2009 by age, highlighting the increased number of cases in the "baby boomer" generation in both males and females (Orkis, 2019).

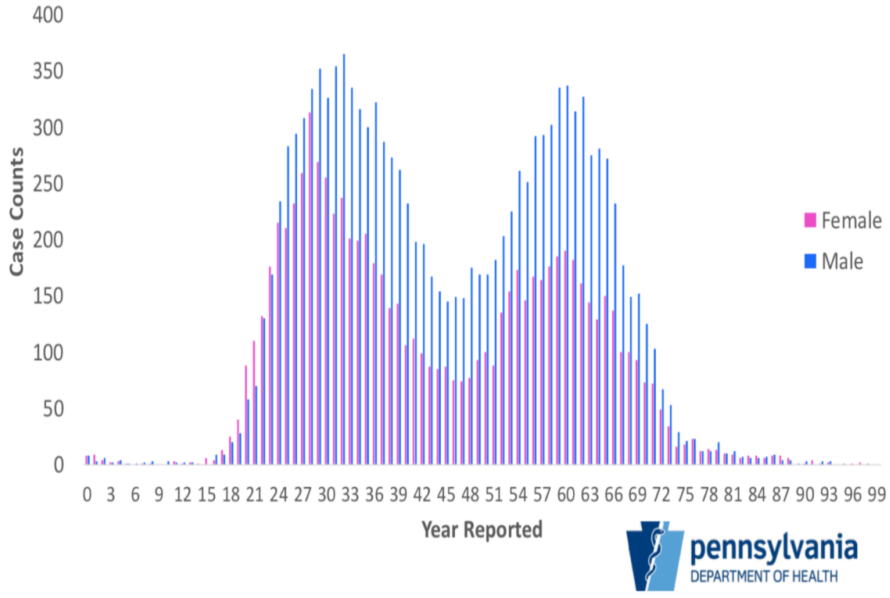


Figure 3. Chronic HCV, Confirmed and Probably Cases, 2018, Pennsylvania
A layered bar graph displaying the chronic HCV confirmed and probable cases in 2018 by age of individual when reported, highlighting the increased number of cases in the millennial generation and generation X, in both males and females, compared to the 2009 data, due to the opioid epidemic (Orkis, 2019).

1.4 Purpose

The opioid epidemic is an important public health concern for many reasons, with increased risk of bloodborne pathogen infection transmission being one of the most prevalent. Rural areas, such as Crawford County, are at an increased risk of an HCV outbreak due to a plethora of healthcare disparities and other barriers affecting health associated with rural living. The purpose of this essay is to examine the current policies related to the control of injection opioid use and HCV transmission in a rural Pennsylvanian county. The essay will focus on Crawford County to identify opportunities for improvements in policy regarding HCV and opioids.

This essay will first describe the relationship between opioid use rates and HCV prevalence in rural Pennsylvania, specifically in Crawford County, then identify current treatment options for opioids and HCV in Crawford County, as well as identify current policy related to opioids in Crawford County, and conclude with recommendations for policy improvements in Crawford County, Pennsylvania.

2.0 Methods

Information for Crawford County, Pennsylvania was obtained to complete a policy analysis. This included the current status of harm reduction and treatment services, particularly those relating to the increased need for treatment and prevention of opioid use and related HCV infections. Information was obtained by reviewing state and local policies and through a personal communication with preventative health specialists. Policies and services currently enacted in Crawford County were assessed to develop recommendations for improvements in the policies specifically pertaining to opioid use, prevention and treatment, and HCV.

A summary of relevant literature pertaining to opioid use and HCV transmission was reviewed. Relevant literature was found via a PubMed database search with emphasis on the search terms: Hepatitis C virus, opioid use, injection drug use, treatment, prevent, harm reduction, rural areas, Crawford County, and Pennsylvania. Only sources published after 2009 were used for data collection in order to present the most recent information, with the exception of articles used strictly for historical and background information. As HCV data is often unreliable due to the misdiagnosing acute cases and the lack of chronic HCV reporting, a personal communication was conducted with a representative from the Pennsylvania DOH regard HCV data.

Pennsylvania state-related policies regarding opioid use, monitoring, prevention and treatment were also examined. Information was obtained from reviewing state and local policies. Relevant literature regarding the Pennsylvania PDMP guidelines, the opioid prescribing guidelines for prescribers, the opioid distributing guidelines for pharmacists, and the current laws regarding opioid possession without a prescription were also examined. Said relevant literature

was identified from the Pennsylvania DOH in cooperation with the Pennsylvania Pharmacists association, the Pennsylvania Department of Drug and Alcohol Programs (DDAP) database, the CDC, the WHO, and PubMed.

A review of current prevention, treatment and harm reduction services in Crawford County was also completed. Personal communications with preventative health specialists provided the most up-to-date information regarding the current organizations in Crawford County offering harm reduction and treatment services. Personal communications were necessary because of the absence of publications on harm reduction and treatment services in Crawford County.

The above resources provided the content of this essay and were utilized for the development of potential recommendations for improvement, new approaches to address the opioid epidemic, and begin the development of more effective policies in Crawford County.

3.0 Results

All counties in Pennsylvania, including Crawford County, adhere to the same guidelines pertaining to polices and regulations for opioid use and HCV. There are currently no policies, regulations, or laws on these public health issues that are specific to Crawford County. The Commonwealth of Pennsylvania provides guidelines for physicians of various specialties on prescribing opioids to treat chronic pain. Additionally, the Pennsylvania Commonwealth, along with the Pennsylvania Pharmacists Association, created a similar, set of guidelines for pharmacists to follow when distributing opioid pain medications to patients. These guidelines are recommended for every physician and pharmacist in every healthcare setting in Pennsylvania. However, there is no penalty for not complying with the recommendations provided. As part of the 2017-2018 state budget, the Commonwealth of Pennsylvania allotted portions to fund programs and initiatives that aid in addressing the opioid epidemic.

The state of Pennsylvania, including Crawford County, operates under the advisement to use the same HCV testing and treatment protocol as the rest of the United States. The CDC uses the National Notifiable Disease Surveillance System (NNDSS) to record and quantify HCV cases across the country. Similarly, the implementation of action plans such as the US Department of Health and Human Services (DHHS) plan from 2011, the prevention and treatment regulations outlined by the American Association for the Study of Liver Disease (AASLD), and the Infectious Diseases Society of America (IDSA) are recommended for all states in the county.

3.1 Current Opioid Related Policy in Crawford County

3.1.1 The Pennsylvania PDMP

The Pennsylvania PDMP was implemented on August 25th, 2016. The implementation of this program was an extremely influential step towards diminishing the opioid epidemic. The database allows all prescribers to regulate the dispensing of prescriptions and controlled substances (Pdmpassist.org, n.d.). Prescribers can review patients records in the database prior to the patient visiting to ensure that the medications prescribed are safe and accurate for that individual. Pharmacists are required to update the database when distributing prescriptions and controlled substances (Patrick et al., 2016). The Pennsylvania DOH and the Pennsylvania DDAP created a guide explaining the Pennsylvania PDMP. The document outlines various facets of the PDMP including what it is, how to access, the importance of use by opioid prescribers and distributers, use for clinical decisions, incorporation of PDMP into the clinical workflow, appropriate prescribing of opioids and management of chronic pain, referral procedures for persons with substance use disorders, discussing substance use with patients, and how to safely wean patients off of opioids (Patrick et al., 2016). The PDMP falls under Act 122 of 2016, the Safe Emergency Prescribing Act, and noncompliance with this act may result in disciplinary action (Health.pa.gov, 2017).

3.1.2 The Opioid Prescribing and Dispensing Guidelines

To aid in the regulation and prescribing of opioids, the Commonwealth of Pennsylvania collaborated with various programs to create guidelines for prescribers and healthcare professionals to aid in making informed decisions and providing the best education to the patients. In recent years, the Commonwealth of Pennsylvania and the Pennsylvania DOH created

guidelines for physicians to utilize when prescribing opioids to patients. They created different sets of guidelines for different patient populations including treating chronic non-cancer patients, emergency department pain treatment, opioids in dental practice, obstetrics and gynecology opioid prescription, geriatric pain management, use of addiction treatment medications in pregnant patients, safe prescribing of benzodiazepines for acute treatment of anxiety and insomnia, orthopedics and sports medicine, pediatrics and adolescent populations, workers compensation, and treating pain in patients with opioid use disorder (OUD) (CDC, 2018). Each set of guidelines outline the steps and precautions a provider should take before prescribing opioids for pain management and are specific to the needs of each population.

Additionally, the Commonwealth of Pennsylvania and the Pennsylvania Pharmacists Association created guidelines for use of opioid pain medication in a safe and appropriate manner. The guidelines are separated into three sections that affect pharmacists in every practical setting. The first portion is on general pain treatment including types of pain, pain assessment, and opioid medication therapy. The second portion assures that all distributed medications are relevant and will not cause harm to the individual via a checklist. The third portion expands on resources for the pharmacist or family of an individual with a substance use disorder and resources for the individuals themselves (Dos.pa.gov, 2019).

The first portion of the Opioid Dispensing Guidelines is essential as an accurate pain assessment could lead to a more accurate medication prescribing and could reveal a need for concurrent pain management therapies or treatments to deal with another types of pain. The pain assessment tool most often utilized by opioid prescribers and distributors is known as the "PQRST-U" (Table 4) (Dos.pa.gov, 2019).

Table 4. PQRST-U

Assessment Question	Explanation
Palliative/Aggravating Factors	What makes the pain better and what makes the pain worse? This can be medications, activities, non-pharmacologic therapies and alternative therapies.
Quality	What does the pain feel like? This is the most important question as it best determines the type of pain and appropriateness of the current medication regimen.
Radiation	Does the pain travel (as in sciatica) as it may represent a different type of pain requiring alternative therapies?
Severity/Sleep	What is the intensity of the pain on a scale? High medication use with high level of pain should act as a red flag to lack of efficacy. Also, it is important to track hours of sleep a night. Chronic pain highly effects quality of sleep, causing mostly insomnia. With fatigue and sedation being common adverse effects of several pain medications, knowing when to dose these based on sleep is important for patient centric care.
Time	What time of day does the pain hurt the most? Coupling this information to the amount of sleep a patient gets lends to better timing of medication uses throughout the day. Should the patient experience pain more in the morning, taking medication prior to bed will help prevent this. Pain experienced in the afternoon/evening should result in medication being taken earlier in the day.
You	How does the pain affect you? Question to find the impact pain is having on emotions, relationships, feelings of self-worth, family life. This is important as extreme emotional pain can impede medication therapy efficacy. This can open the door for the patient to be referred to a psychologist or social worker for cognitive behavioral therapy.

"PQRST-U" is the most commonly utilized pain assessment tool, implemented by the Commonwealth of Pennsylvania and the Pennsylvania Pharmacists Association for opioid prescribers and distributors (Dos.pa.gov, 2019).

The first section of the Opioid Dispensing Guidelines also indicates that opioid pain medication is divided into two different groups based on duration of action (Scheurer, 2011). In acute cases, "short acting" medications are most often utilized. This includes immediate release forms of oxycodone, morphine sulfate, and hydrocodone (Scheurer, 2011). The guidelines make it clear that "long-acting", including extended release oxycodone, extended release morphine

sulfate, fentanyl patches, and methadone opioids should never be an initial pain reduction therapy (Scheurer, 2011). Many guidelines report that no more than 120mg of morphine or morphine equivalent should be consumed per day, as a higher dosage of pain medication does not necessarily equate to greater pain reduction but could put one a risk for dependency (McPherson, 2009).

The checklist outlined in the second portion of the Opioid Dispensing Guidelines is utilized to ensure that the patient is receiving the safest, most accurate form of treatment. The first item on the checklist is to verify the legitimacy of the patient, provider, and prescription. The Opioid Dispensing Guidelines recommend using the risk management strategy "VIGIL" to verify the legitimacies (Table 5).

Table 5. VIGIL Risk Assessment

Assessment	**Question**
Verification	Is this a responsible opioid user?
Identification	Is the identity of this patient verifiable?
Generalization	Do we agree on mutual responsibilities and expectations?
Interpretation	Do I feel comfortable allowing this person to have controlled substances?
Legalization	Am I acting legally and responsibly?

A risk assessment strategy recommended by the Opioid Dispensing Guidelines to verify the legitimacy of the patient, the provider, and the prescription (Dos.pa.gov, 2019).

The remainder of the checklist includes ensuring the medication, dose, and quantity are correct and safe for the patient and selected therapy, determining if the prescription will lead to any drug to drug interactions with other new and/or preexisting drugs, determining if the patient has a medication use agreement with the providers and the pharmacy, providing appropriate

patient education and support, contacting the provider with any concerns, and when in any doubt, communicating with the prescriber (Dos.pa.gov, 2019).

The third, and final, portion of the Opioid Dispensing Guidelines gives pharmacists resources currently available to present to patients in need. The guideline recommends that pharmacists use the Screening, Brief Intervention and Referral to Treatment (SBIRT) assessment (Hargraves et al., 2017). The SBIRT assessment is a public health assessment approach that helps pharmacists accurately give patients available resources to help with substance use disorders (Dos.pa.gov, 2019); (Hargraves et al., 2017). The "SBIRT" assessment recommends screening to quickly assess the severity of substance use and misuse and identify the appropriate level of treatment, brief intervention to focus on increasing insight and awareness regarding substance use and misuse and motivation toward behavioral changes, and referral to treatment to provide those identified as needing more extensive treatment with access to specialty care (Dos.pa.gov, 2019); (Del Boca et al., 2017).

3.1.3 Governor Wolf's Steps to Address the Opioid Epidemic

In 2016, Pennsylvania Governor Tom Wolf implemented new steps to address the opioid epidemic ("Governor Wolf Signs Bills to Battle Heroin and Opioid Crisis", 2017). The changes were intended to assure appropriate prescription of opioids under the Medicaid program. Under the new regulations, the Department of Human Services (DHS) planned to take the following steps for Medicaid providers to require all ordering, prescribing, or referring providers who are identified on claims be enrolled in the Medicaid program, work with the Pennsylvania DDAP to cease allowing providers to accept cash payments from Medicaid recipients, audit and potentially un-enroll providers who prescribe medication such as buprenorphine without an office visit,

encourage Medicaid Managed Care Organizations (MCOs) to terminate poor providers that do not meet certain quality metrics, implement standardized prior authorization guidelines similar to those most recently implemented for the Medicaid Fee-For-Service Program, and refer high-volume providers with poor quality records to DHS Bureau of Program Integrity for review and action ("Pa Tightens Medication Rules to Help Combat Opioid Crisis", 2017).

In addition to the implementation of the new DHS regulations, the enhancing of Pennsylvania's PDMP, and the new opioid prescribing guidelines, the Commonwealth of Pennsylvania has also implemented a new law limiting the amount of opioids that a minor can be prescribed within a week ("Governor Wolf Signs Bills to Battle Heroin and Opioid Crisis", 2017); (Health.pa.gov, 2017). Table 6 presents the bills that Governor Wolf signed into law in 2016. The penalty for prescribers who violate these acts results in licensing board sanctions (Health.pa.gov, 2017). The Commonwealth of Pennsylvania also allotted $108.3 M of the 2017 – 2018 budget to invest in new programs aim to diminish the opioid epidemic ("Pa Tightens Medication Rules to Help Combat Opioid Crisis", 2017). Table 7 displays the allotted budget strictly for battling opioid use and misuse and the programs the money funded.

Table 6. Governor Tom Wolf Signed into Law in 2016 to Address Against the Opiood Epidemic

Bill	What the Bill Establishes
Act 126 SB1367 (Yaw)	Amends Title 35 (Health and Safety) to establish restrictions on physicians' ability to prescribe opioids to minors, including limiting prescriptions to seven days and requiring physicians to take a number of steps before issuing the first prescription in a single course of treatment.
Act 125 SB1368 (Killion)	Establishes a safe opioid prescribing curriculum in medical colleges and other medical training facilities offering or desiring to offer medical training. The curriculum must include current, age-appropriate information relating to pain management; alternatives to opioid pain medications; instructions on safe prescribing methods in the event opioids must be prescribed; identification of patients who are at risk for addiction; and, training on managing substance use disorders as chronic diseases.
Act 124 SB1202 (Yaw)	Amends the Achieving Better Care by Monitoring All Prescriptions Program (ABC-MAP) Act requires continuing education in pain management, addiction and dispensing for prescribers and dispensers. Prescribers are required to check the ABC-MAP every time they prescribe an opioid or benzodiazepine. Dispensers are required to input prescription data to the ABC-MAP within 24 hours of dispensing. Dispensers (who are required to enter information into the ABC-MAP when they dispense an opioid or other controlled substance) have 72 hours to enter information.
Act 122 HB1699 (Brown)	Mandates that hospital emergency departments and urgent care centers may not prescribe opioids in quantities that last more than seven days and they may not write refills for opioid prescriptions.
Act 123 HB 1737 (Maher)	Allow all federal, state and local law enforcement entities, hospitals, assisted living facilities, home healthcare agencies, long-term care nursing facilities, hospice, and commonwealth licensed pharmacies to serve as drop-off locations for any extra, unwanted, or expired prescription drugs or over-the-counter pharmaceutical products.

The bills that Pennsylvania Governor Tom Wolf signed into law in 2016. The bill and what each bill establish are presented ("Governor Wolf Signs Bills to Battle Heroin and Opioid Crisis", 2017); (Health.pa.gov, 2017).

Table 7. Portion of the 2017 - 2018 Pennsylvania Budget Allotted to Funding Programs to Address the Opioid Epidemic

Amount (US dollars)	**Continued Investment**
20.4 million	Continuation of the 45 Centers of Excellence throughout Pennsylvania to help coordinate holistic treatment for people with a substance use disorder.
45 million	Continuation of funding services to address heroin and opioid addition through the Single County Authorities.
3 million	Expansion of PDMP, continuing to allow physicians to see what patients are being prescribed and to ensure that it is safe and accurate for their condition, and allowing physicians to guide patients into treatment if they are with a substance use disorder.
Amount (US dollars)	**New Investment**
10 million	Initiative to expand access to naloxone to first responders (through competitive grants) was awarded through the Pennsylvania Commission of Crime and Delinquency (PCCD).
3.4 million	Initiative to expand specialty drug courts in PCCD to make expand treatment strategies to divert PWID into recovery and treatment services.
26.5 million	Federal Cures Act funds used to expand access to treatment services, specifically for individuals who are uninsured or underinsured.

The continued and new programs that the Commonwealth of Pennsylvania invested in, in 2017 -2018 to aid in diminishing the opioid epidemic ("Pa Tightens Medication Rules to Help Combat Opioid Crisis", 2017).

3.1.4 Opioid Possession Laws

It is illegal for an individual to knowingly possess drugs listed on Schedules I – V unless a prescription was written by a medical professional or the individual is registered by the Commonwealth of Pennsylvania (Burris, 2018). If an individual in Pennsylvania possess any version of opioids without a valid prescription from a physician, they face legal ramifications ranging from losing the right to carry a firearm, fines, and prison time. Table 8 presents the consequences in the state of Pennsylvania for opioid drug possession and trafficking.

Table 8. Consequences for Illegal Opioid Drug Possession and Trafficking in Pennsylvania

Weight (grams)	Prison Time	Fines
1g to < 5g	1st = 2 years Prior = 3 years	1st = $5,000 Prior = $10,000
5g to < 50g	1st = 3 years Prior = 5 years	1st = $15,000 Prior = $30,000
50g or more	1st = 5 years Prior = 7 years	1st = $25,000 Prior = $50,000

A table displaying the mandatory minimum sentencing for opioid drug possession and trafficking in Pennsylvania (The official website for the Pennsylvania General Assembly., n.d.).

3.2 Current Hepatitis C Virus Related Policy in Crawford County

3.2.1 National Notifiable Disease Surveillance System

The CDC has a publicly available database where any person is able to access data on notifiable diseases called the NNDSS. Acute HCV has been a notifiable disease, any disease that is required to be reported by law, since 1994. However, chronic HCV has not been a reportable disease for as long. According to the CDC's NNDSS from 2003 to 2009 past and present cases of chronic HCV were notifiable. In 2010, only present cases were notifiable. From 2011 to 2015 past and present cases were notifiable again. Finally, from 2016 to present date just current HCV cases are notifiable (National Notifiable Diseases Surveillance System (NNDSS), n.d.). Each notifiable disease has a case definition. These definitions are not used for clinical practice but by public health workers to classify and record notifiable diseases. As of 2016, the CDC's surveillance case definition for acute HCV is identified as, "An illness with discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and jaundice, or peak elevated serum alanine aminotransferase (ALT) level >200 IU/L during the period of acute illness." (National Notifiable

Diseases Surveillance System (NNDSS), n.d.). As of 2016, the CDC's surveillance case definition for chronic HCV is defined as, "A case that does not meet clinical criteria or has no report of clinical criteria, does not have test conversion within 12 months or has no report of test conversion, and has a positive HCV NAT or HCV antigen test" (National Notifiable Diseases Surveillance System (NNDSS), n.d.).

3.2.2 Unites States DHHS Action Plan

In 2011, the DHHS released a nationwide action plan to combat the growing rates of HCV in the United States (Denniston et al., 2014). The DHHS stated that if the entire country implemented this action plan, the percent of individuals aware of their HCV status would increase from 45% to 66% and the number of new reported cases would be reduced by 25% (Ward, Valdiserri and Koh, 2012). The action plan outlined three steps that needed to be taken to combat HCV transmission including identify barriers to screening and treatment, determine strategies to overcome said barriers, and redirect public policy to implement improved strategies (Table 9) (DHHS, 2013).

Table 9. DHHS Outlined Goals and their Proposed Implementations

Goal	Proposed Implementation
Improved community awareness and provider education	1) Create an educational curriculum for HCV prevention, care, and treatment to be used by multiple disciplines of health professionals 2) Integrate viral hepatitis into the curricula of all DHHS healthcare provider training programs 3) Collaborate with professional, medical, and other organizations to build a workforce capable of providing HCV-related prevention, care, and treatment
Improved testing, care, and treatment	1) Create standard recommendations to guide HCV testing and referral to care 2) Implement routine HCV testing and linkage to care as standard practice in healthcare systems 3) Promote health information technology to improve testing and enhance referral to viral HCV care 4) Develop care models to optimize management of the diverse populations with HCV
Strengthened public health surveillance	1) Integrate electronic laboratory and medical records as components of HCV surveillance 2) Collect data at the community level to help state and local programs identify and address HCV related health disparities 3) Document and monitor provision and impact of testing, care, and treatment services
Improved HCV services for PWID	1) Integrate viral HCV prevention and care services as standard components of substance use disorder treatment programs 2) Integrate HCV prevention services with HIV prevention programs 3) Enhance substance use disorder treatment 4) Increase access to state and local syringe service programs as part of a comprehensive approach that includes access to substance use and misuse prevention and treatment services 5) Promote integrated approaches for managing HCV infected patients who have comorbid health conditions
Development of HCV vaccination	1) The action plan placed urgency on the FDA, the National Institutes of Health (NIH), and the CDC to develop a vaccine to prevent HCV
Prevention of HCV in healthcare settings	1) Improve surveillance and detection of outbreaks in healthcare settings 2) Lower the risk of HCV transmission associated with improper handling and use of point-of-care devices, reusable equipment, and syringes 3) Improve provider education regarding basic infection control and improve infection control oversight at long-term care and outpatient facilities 4) Reduce device-related percutaneous exposures 5) Update existing guidelines for management of HCV exposures in healthcare settings

The goals that the DHHS outlined in the 2011 action plan to combat HCV transmission and the goals proposed implementations (DHHS, 2013).

3.2.3 Pennsylvania Medicaid Expansion

Although Pennsylvania does not differ from the rest of the country regarding policies and regulations for opioid use and HCV, states do differ in expansion of Medicaid. Medicaid in the United States is a federal and state program that helps with medical costs for some people with limited income and resources. Each state determines what services and treatments will be covered by this program.

When an individual receives a positive test result for HCV a liver function test is obtained and the score is based on disease severity (Natap.org, 2017). The liver function test score ranges on a scale from F_0 to F_4, where F_0 is the least severe and F_4 is the most severe (Natap.org, 2017). In recent years, Pennsylvania state Medicaid covered medications and treatment for individuals who scored anywhere from F_2 to F_4, unless there were other medical complications worsening the individual's conditions. The exceptions were mandated on a case-by-case basis. However, as of July 1, 2017, the Pennsylvania DHS mandated that the Medicaid policy surrounding HCV care will be expanded to cover medication and treatment of individuals who have F_0 and F_1 liver function test scores (Natap.org, 2017).

3.2.4 AASLD and IDSA Guidelines

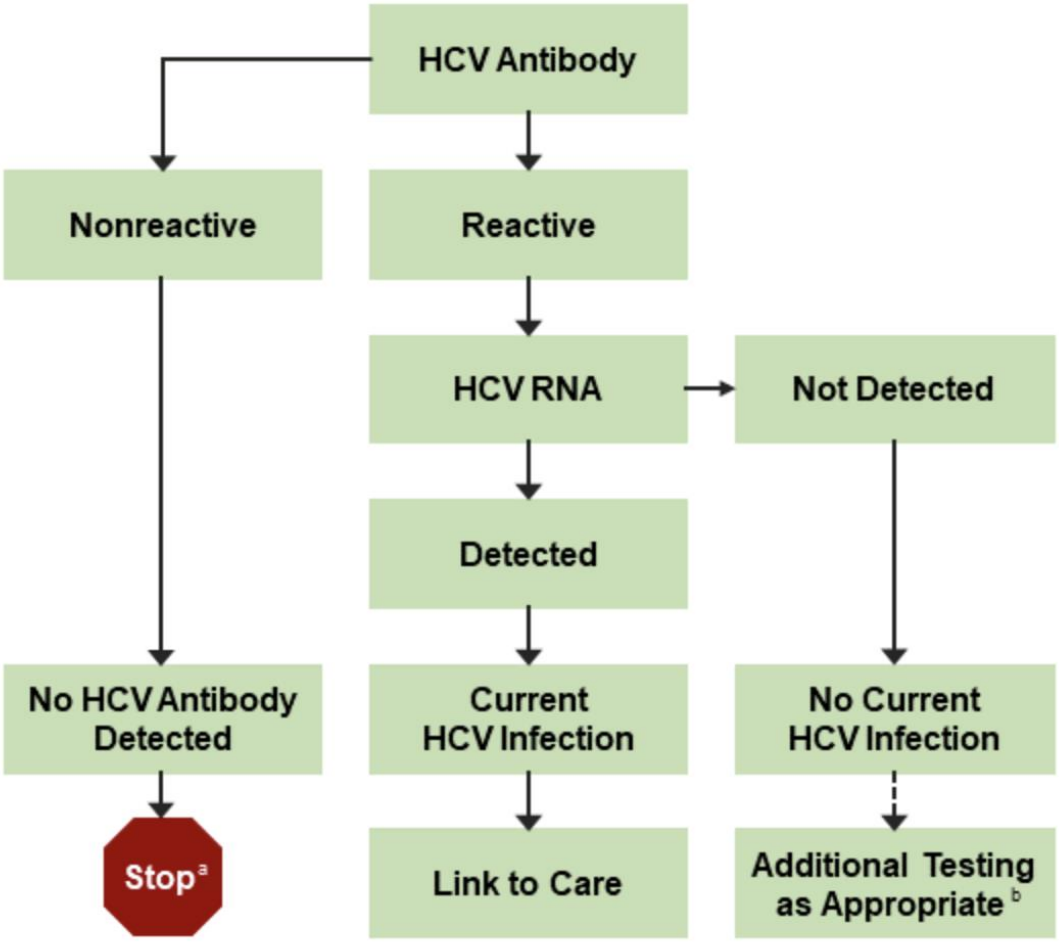
The American Association for the Study of Liver Disease and the Infectious Disease Society of America issued guidelines in 2015, and updated in 2018, that outlined recommendations for testing, managing, and treating HCV. The guidelines exactly follow the CDC's recommendation of one time testing for individuals that are current or former PWID, intranasal drug users, individuals born between 1945 and 1965, recipients of clotting factors made before 1987, recipients of blood transfusions or solid organ transplants prior to July 1992,

chronic hemodialysis patients, individuals with known exposure to HCV (i.e. healthcare workers (HCW) after needle sticks involving HCV positive blood, recipients of blood or organ transplants from individuals who test HCV positive, etc.), individuals with HIV, sexually active people that are about to begin taking preexposure prophylaxis (PrEP) for HIV prevention, unexplained chronic liver disease, and children born to HCV positive mothers (CDC, 2019. They also recommend annual HCV screens for PWID, MSM, and individuals that routinely participate in at-risk behaviors (AASLD and IDSA, 2019).

The guidelines outline recommendations for initial HCV testing and follow up (Figure 4), the recommended testing sequence for identifying current HCV infections (Figure 5), and recommendations for counseling individuals with an active HCV infection (Figure 6). The guidelines also call to attention that all individuals with an active HCV infection should be linked to a physician that is equipped to provide comprehensive management and treatment (AASLD and IDSA, 2019).

Recommendations for Initial HCV Testing and Follow-Up
An HCV-antibody test is recommended for initial HCV testing. If the result is positive, current infection should be confirmed by a sensitive HCV-RNA test.
Among persons with a negative HCV-antibody test who are suspected of having liver disease, testing for HCV RNA or follow-up testing for HCV antibody is recommended if exposure to HCV occurred within the past 6 months; testing for HCV RNA can also be considered for persons who are immunocompromised.
Among persons at risk of reinfection after previous spontaneous or treatment-related viral clearance, initial HCV-RNA testing is recommended because an HCV-antibody test is expected to be positive.
Quantitative HCV-RNA testing is recommended prior to initiation of antiviral therapy to document the baseline level of viremia (i.e. baseline viral load).
HCV genotype is recommended to guide selection of the most appropriate antiviral regimen.
Individuals found to have a positive HCV-antibody test and negative results for HCV RNA by polymerase chain reaction should be informed that they do not have evidence of current (active) HCV infection.

Figure 4. The Recommendations for Initial HCV Testing and Follow up Outlined by the ASSLD and the IDSA Guidelines
(CDC, 2013); (AASLD and IDSA, 2019)



[a] For persons who might have been exposed to HCV within the past 6 months, testing for HCV RNA or follow-up testing for HCV antibody should be performed. For persons who are immunocompromised, testing for HCV RNA should be performed.

[b] To differentiate past, resolved HCV infection from biologic false positivity for HCV antibody, testing with another HCV-antibody assay can be considered. Repeat HCV-RNA testing if the person tested is suspected to have had HCV exposure within the past 6 months or has clinical evidence of HCV disease, or if there is concern regarding the handling or storage of the test specimen.

Adapted from Centers for Disease Control and Prevention (CDC), 2013 (CDC, 2013)

Figure 5. The Recommendations Outlined by the CDC for Testing Sequences Used to Identify Current HCV Infections Found in the AASLD and the IDSA Guidelines
(CDC, 2013); (CDC, 2013); (AASLD and IDSA, 2019).

Recommendations for Counseling Persons with Active HCV Infection
Individuals with current HCV infection should receive education and interventions aimed at reducing liver disease progression and preventing HCV transmission.
Abstinence form alcohol and, when appropriate, interventions to facilitate cessation of alcohol consumption should be advised for all persons with HCV infection.
Evaluation for other conditions that may accelerate liver fibrosis, including hepatitis B and HIV infections, is recommended for all persons with active HCV infection.
Evaluation for advanced fibrosis using liver biopsy, imaging, and/or noninvasive markers is recommended for all persons with HCV infection to facilitate an appropriate decision regarding HCV treatment strategy, and to determine the need for initiating additional measures for cirrhosis management.
Vaccination against pneumococcal infection is recommended for all patients with cirrhosis.
Vaccination against hepatitis A and hepatitis B is recommended for all susceptible persons with HCV infection.
All persons with HCV infection should be provided education about how to avoid HCV transmission to others.

Figure 6. The Recommendations for Counseling Individuals with Active HCV Infectious Outlined by the AASLD and the IDSA Guidelines
(CDC, 2013); (CDC, 2013); (AASLD and IDSA, 2019).

3.3 Current Substance Use and Hepatitis C Virus Treatment in Crawford County

There are various opioid use and HCV transmission harm reduction efforts and treatment services ongoing in Crawford County. There are still barriers to care for residents of rural areas such as Crawford County. Obstacles such as limited access to transportation, access to healthcare, access to education, stigma, and polysubstance use and misuse, and lack of knowledge and awareness of individuals, families, provider, and the communities.

Meadville Medical Center is a private hospital that is located in Crawford County (J. Tompkins, personal communication, October 30, 2019). Titusville Area Hospital is a non-profit hospital also located in Crawford County. Stepping Stones is a program at Meadville Medical Center that offers hospital rehabilitation, hospital detoxification, and intensive outpatient treatment. Individuals that go to Meadville Medical Center's emergency room showing signs of a substance use disorder are provided acute intervention for overdose and are referred to the stepping stones program. Titusville Area Hospital does not offer a program similar to Stepping Stones. Individuals that seek out treatment at Titusville Area Hospital's emergency room that show signs of a substance use disorder are just provided acute intervention for overdose. However, Meadville Medical Center owns Titusville Area Hospital. Thus, patients from Titusville Area Hospital's emergency room are also referred to the Stepping Stones program at Meadville Medical Center.

There are five rural healthcare clinics where individuals can obtain HCV treatment services. In addition, there are six substance use disorder treatment centers in Crawford County (J. Tompkins, personal communication, October 30, 2019). The substance use disorder treatment centers in Crawford County offer preventative and substance use disorder treatment services (J. Tompkins, personal communication, October 30, 2019).

3.3.1 Treatment and Prevention of Opioid Use in Crawford County

There are several organizations that offer prevention and treatment services including Alpine Springs, the CCDAEC, Family Services and Children's Aid Society, Greenfield Counseling, Mercy House, and Stepping Stones. These organizations offer a range of treatment services from hospital detox, hospital rehabilitation, non-hospital detox, non-hospital

rehabilitation, intensive outpatient, outpatient, and methadone services (Table 10) (J. Tompkins, personal communication, October 30, 2019). The organizations also offer individual and group counseling services as well as twelve step programs for opioid use and misuse. They offer a range of preventative services such as small group education, 12 step programs, speaking engagements, information dissemination, student assistance programs, a 24-hour hotline drug and alcohol hotline, and a 24-hour mental health hotline (CCDAEC, n.d.). Emergency departments are now also providing significant care for persons with overdoses.

Table 10. Summary of the Substance Use Disorder/Opioid Use Disorder Providers in Crawford County by Type

Provider	Location	Hospital Detox	Hospital Rehab	Non-Hospital Detox	Non-Hospital Rehab	Intensive Outpatient	Outpatient Treatment	Methadone	Provide Acute Intervention for Overdose
Alpine Springs	Linesville, PA			X	X				
CCDAEC	Meadville, PA					X	X		
Family Services & Children's Services	Titusville, PA						X		
Greenfield Counseling	Meadville, PA							X	
Mercy House	Meadville, PA							X	
Stepping Stones Meadville Medical Center	Meadville, PA	X	X			X			
Titusville Area Hospital Emergency Room	Titusville, PA								X
Meadville Medical Center Emergency Room	Meadville, PA								X

(J. Tompkins, personal communication, October 30, 2019).

Currently, there are no needle/syringe exchange programs or safe injection facilities in or surrounding Crawford County. There are no known needle/syringe exchange programs in Erie, the closest urban area to Crawford County. The two closest syringe exchange programs to Crawford County are both over 90 miles away, one of which is Prevention Point Pittsburgh in Allegheny County, which is 92 miles from Meadville (Opioid and Health Indicators Database, 2019). The clients of CCDAEC are able to utilize the resources Prevention Point Pittsburgh

offers, however this is a challenge for many PWID due to the long-distance travel required to utilize said resources.

The other syringe exchange program that is in relatively close proximity to Crawford County is in Cleveland, Ohio at the Free Medical Clinic of the Greater Cleveland Area, which is approximately 97 miles away from Meadville (Britton, 2016). Finding transportation from a rural area in Crawford County to Meadville is difficult but finding transportation from Crawford County to Pittsburgh or Cleveland regularly to use the available needle/syringe exchange programs is exceedingly difficult.

In response to the lack of needle/syringe exchange programs in Crawford County, the CCDAE, a single county authority funded by the federal and state government, had a certified recovery specialist set up two syringe disposal boxes in Meadville, one at the public library and one in the downtown mall where the CCDAEC is housed (J. Tompkins, personal communication, October 30, 2019).

3.3.2 Treatment and Prevention of Hepatitis C Virus in Crawford County

Stigma surrounding bloodborne pathogens, such as HCV, interfere with monitoring, testing, prevention, and treatment, increasing the risk of outbreak and transmission in rural areas (Northrop, 2017). None of the organizations that offer HCV prevention and treatment services also offer free HCV testing (J. Tompkins, personal communication, October 30, 2019).

Screening services are offered at the CCDAEC (CCDAEC, n.d.). All intake assessments at the CCDAEC require healthcare workers to ask clients if they would like to be tested for HCV, along with other infectious diseases (J. Tompkins, personal communication, October 30, 2019). HCV testing is also offered at traditional healthcare facilities and rural clinics throughout

Crawford County but none of these organizations offer free testing without insurance (J. Tompkins, personal communication, October 30, 2019).

The CCDAEC is currently making efforts to employ a part-time nurse practitioner to serve PWID and individuals with other substance use disorders. Some of the responsibilities the nurse practitioner would have are conducting testing for HCV and other bloodborne pathogens that are common among PWID and offering referral services. (J. Tompkins, personal communication, October 30, 2019). However, currently the CCDAEC does not have a nurse practitioner on staff. The private hospital located in Crawford County, the Meadville Medical Center, is working in collaboration with the CCDAEC throughout the interview and hiring process (J. Tompkins, personal communication, October 30, 2019).

The CCDAEC has a referral agreement with the North Western Pennsylvania (NWPA) Rural AIDS Alliance for HCV treatment services. The NWPA Rural AIDS Alliance mainly focuses on HIV services but they also provide services for prevention, treatment, and case management for other infectious diseases including HCV. The NWPA Rural AIDS Alliance is funded by Health Resources and Service Administration (HRSA) the HIV/AIDS Bureau, and the Ryan White Part C Program, a program that provides funding to develop early intervention clinics delivering HIV care and treatment for people with HIV (Hab.hrsa.gov, 2019). The services are free to patients receiving government funded medical assistance. However, Crawford County residents have to travel to Erie County if they intend to utilize the services offered by the NWPA Rural AIDS Alliance. This raises the substantial issue of transportation to another county which is a barrier to healthcare for many Crawford County residents (J. Tompkins, personal communication, October 30, 2019).

A physician in a neighboring county received a grant in 2016 from a pharmaceutical company for outreach, HCV testing and follow-up. If patients test positive for HCV, the physician follows up with them or refers them to a physician in the patient's area. If an individual is unable to meet with the physician for the follow-up or they have any further questions, telehealth services are available. The patient's insurance is billed for any co-pays for follow-up testing and treatment, and if the patient is uninsured, they have to pay for the follow-up care themselves. Any individual in the general population that is 18 years of age or older and lives within 90 minutes of said neighboring county is eligible to participate in this program. Therefore, residents of Crawford County are able to participate in this program and utilize the telehealth services (J. Tompkins, personal communication, October 30, 2019).

An individual with HCV can access treatment from the Meadville Medical Center or any of the rural health clinics located in Meadville. There are two physicians at the Meadville Medical Center that specialize in infectious diseases. In Crawford County, there are two gastroenterology physicians that treat individuals with HCV at Meadville Medical Center, and an infectious disease and travel health physician that treats individuals with HCV at their private practices. Many individuals with HCV that are able travel to hospitals in Erie County to receive treatment as well. The Meadville Free Clinic is not technically affiliated with Meadville Medical Center, but they offer HCV screening and treatment services as well. Due to the stark increase in injection drug use and therefore HCV transmission among PWID, individuals who often need services from HCV treatment centers also need substance use disorder treatment services (Lansky et al., 2014).

4.0 Recommendations and Discussion

Although a great deal of progress has been made in opioid use and misuse prevention and treatment as well as HCV transmission, there remain critical gaps in policy in rural areas such as Crawford County. Opioid use rates and HCV transmission rates are still high. To effectively mitigate this problem increased research into pain management and opioid use and misuse is necessary. The implementation of additional HCV harm reduction and treatment services, improved access to treatment services and transportation are also necessary.

There are positives and negatives to every policy and/or recommended procedure surrounding opioid use in Pennsylvania. Researchers at the School of Public Health at Columbia University conducted multiple studies in 2017 and 2018 to determine the effectiveness of PDMPs (Fink et al., 2018). Three of the studies indicated that there was an increase in heroin overdose after PDMP implementations. The authors of the studies noted that because individuals with substance use disorders could not get prescription opioids from physicians, they obtained heroin for their addiction. However, they also found that the prescription opioid use rates decreased in some study subjects due to the lack of overprescribing opioids. Thus, the results were inconclusive, and indicated that more research needs to be done to determine the most effective PDMP practices (Fink et al., 2018).

Public health professionals make the same arguments with regard to the opioid prescribing and dispensing guidelines for physicians and pharmacists. All of the checklists and assessments outlined in the guidelines help to ensure that safe and accurate amounts of opioids are prescribed and distributed to patients. However, if individuals with substance use disorders cannot have access to prescription opioids from a provider, the likelihood of them turning to

“street” opioids increases (CDC, 2018). For this reason, it is imperative that physicians, pharmacists and other healthcare workers follow the protocols outlined in the guidelines that give instructions on how to refer individuals with substance use disorders to treatment and counseling services.

Governor Wolf made considerable strides moving Pennsylvania forward in addressing the opioid epidemic. However, all of the bills that were signed into law in 2016 solely focused on regulating opioid prescriptions and making it increasingly difficult for individuals with substance use disorders to be prescribed opioids. Although the reduction of overprescribing opioids is extremely important in deterring the misuse of opioids, very little other harm reduction and opioid treatment policy changes have been made in Pennsylvania. Governor Wolf began addressing opioid use by distributing $108.3 M of the 2017 – 2018 Pennsylvania budget to different opioid treatment and prevention programs.

Programs are needed that go beyond just preventing the over prescribing of opioids. Programs are needed to provide harm reduction services for underinsured and uninsured individuals, expand drug courts, expand naloxone for use by first responders, aid in the coordination of holistic treatment for substance use disorders, and fund services for opioid prevention and treatment through single county authorities ("Pa Tightens Medication Rules to Help Combat Opioid Crisis", 2017). Although these investments aid in the prevention of HCV transmission and the prevention and treatment of opioid use, no statewide initiatives have been enacted to specifically improve existing services or implement new harm reduction efforts in rural areas such as Crawford County.

One of the major gaps with the current policy regarding opioid use is the limited opportunity for drug treatment in leu of a jail sentence for individuals found guilty of possessing

opioids without a legal prescription. The current laws in Pennsylvania indicate that if an individual is found guilty of possession of illegal opioids they will be jailed and/or fined (Burris, 2018). There have been many studies conducted that suggest that prison settings that do not offer any substance use disorder treatment are not as effective as prison settings that include drug rehabilitation and substance use disorder treatment programs. For example, Swedish researchers gave either a placebo or buprenorphine in combination with "intensive psychosocial therapy for heroin dependence" in a randomized controlled trial (Kakko, 2003). After one year, 75% of individuals in the buprenorphine treatment group were no longer actively addicted to opioids, while 0% of individuals in the placebo group were "cured" of their addiction (Kakko, 2003).

Research shows that the continued use of opioids alters the way that the brain functions by changing its dopamine inhibitors and reward centers, which in turn causes the individual to continue opioid use regardless of health or legal consequence (NIDA, 2014). The brains of individuals with substance use disorders need to be retrained and learn how to avoid relapse (NIDA, 2014). Continued research on drug use has not only given researchers and medical professionals a better understanding of how drug addiction affects the body, but has also indicated that with the appropriate treatment, individuals with substance use disorders can be treated and go on to live healthy lives (NIDA, 2014).

There are positive and negative aspects to the current HCV harm reduction efforts and policies in Pennsylvania as well. Acute HCV being a notifiable disease is beneficial because it helps researchers formulate data and conduct statistical analyses related to HCV. However, acute HCV is often missed because in PWID, the symptoms are often misdiagnosed as withdrawal symptoms, and in non-PWID, the symptoms are often misdiagnosed as influenza. Therefore, many cases of HCV are undetected until they have reached a chronic infection (NIH, 2016). In

addition, since the criteria regarding cases of HCV that are notifiable has changed multiple times throughout recent years many cases have gone unreported. This has resulted in an extremely high number of missed cases of HCV, both acute and chronic, rendering the existing data unreliable (NIH, 2016). Although the criteria for HCV case notifications are by the CDC, historically HCV surveillances practices have been inconsistent (Moore et al., 2019). Even though chronic HCV is a nationally notifiable disease, not all states require chronic HCV cases to be reported, which is another factor that leads to the vastly unreliable HCV data (Moore et al., 2019). It has been mandated in Pennsylvania that chronic HCV is a notifiable disease and must be reported to the CDC since 2002 (Roberts et al., 2019).

The 2011 DHHS action plan to combat the growing rates of HCV in the United States is a good plan in theory. However, there is no way to ensure that healthcare providers following the recommended action plan. One approach to assure that healthcare providers follow the recommended treatment for guidelines is to link reimbursements to adherence to the recommended guidelines. Without the consistent implementation of the harm reduction efforts recommended in the action plan across the US, there will not be a dramatic decrease in the transmission of HCV because without increased prevention and treatment services for HCV the transmission of HCV among PWID will continue to increase (Guo and Sims, 2017). The same can be said for the guidelines that the AASLD and the IDSA issued in 2015 and updated in 2018 that outline recommendations for testing, managing, and treating HCV (AASLD and IDSA, 2019).

The expansion of Medicaid by states to include covering medications and treatment for individuals who scored anywhere from an F_0 to an F_4, unless there were other medical complications worsening the individual's conditions which were mandated on a case-by-case

basis, was an incredible improvement in the treatment of individuals with HCV that qualified for Medicaid in Pennsylvania. A study conducted in Virginia exemplified how beneficial the "treat all" strategy was and resulted in 36,752 fewer cases of cirrhosis, 1739 fewer liver transplants, 8,169 fewer cases of hepatocellular carcinoma, 16,173 fewer HCV-related deaths, 0.84 additional life-years per patient, and 1.03 additional quality-adjusted life-years per patient (Younossi et al., 2017). The same study also concluded that treating all Medicaid patients with chronic HCV regardless of their "F score" is projected to save 39.4% in future potential treatment costs (Younossi et al., 2017). Although the expansion was highly beneficial for individuals with HCV that qualify for Medicaid, many individuals with HCV that do not qualify for Medicaid may still not be able to afford HCV medications and treatment. Therefore, the uninsured and underinsured population with HCV still face this barrier to treatment.

4.1 Challenges in Crawford County

There are many barriers to care in rural areas of Pennsylvania and especially in Crawford County. One of the biggest challenges that Crawford County faces is the inconsistent compliance of healthcare providers to enforce the recommend guidelines surrounding HCV and opioid use prevention, treatment, and care (J. Tompkins, personal communication, October 30, 2019). This is a dilemma all across the United States but is critically highlighted in rural areas such as Crawford County with a high burden of opioid use, poverty, and unemployment. The lack of health professionals having access to and being informed on the most up-to-date and accurate recommendations for care results in a large barrier to treatment for PWID, especially those living with HCV. Due to the shortages of knowledge and healthcare workers in rural areas, many of the

existing healthcare providers do not follow all of the aforementioned recommendations at all times especially when it comes to screening and referral to care.

An additional consequence of limited health professional training on the recommend guidelines for HCV and opioid use disorders is the lack of knowledge that HCV treatment can begin while a patient is still using illicit drugs. Side effects and drug-to-drug interactions with opioid treatment medications and the HCV treatment medication have not been reported. Both can be administered at the same time (Martinello et al., 2017). Previously, an individual had to be abstinent for 6 to 8 weeks to begin HCV treatment. Currently, treatment can begin immediately (Martinello et al., 2017). It is the responsibility of the health professionals to assess the need for treatment and refer the patient to counseling services, which is why the lack of provider expertise and/or compliance is such a critical barrier to care. It can be argued that PWID should be prioritized for treatment since they are at the highest risk of transmitting HCV and other bloodborne pathogens.

Providers' subconscious biases can severely impact their patient's care and as a result, PWID in many cases are not referred to effective treatment options (Blair, Steiner and Havranek, 2011). Potential provider biases towards substance users include the idea that drug treatment does not work, substance users do not want treatment and substance users many manipulate to obtain opioids. Studies have been conducted that indicate that provider biases toward substance use and misuse causes a greater barrier to referrals and treatment than many other factors such as mental illness, referral declining, loss of follow-up, medical diseases and no documentation (Blair, Steiner and Havranek, 2011). In order for providers to avoid subconscious biases affecting their practice when it comes to substance users they should consider the situation through the patient's perspective, avoid stereotypical comments, and partner with researchers

who focus on subconscious biases and develop evidence-based interventions (Blair, Steiner and Havranek, 2011). In order for healthcare workers to appropriately achieve this motivational interviewing should be implemented and SBIRT should be integrated into all clinical encounters for all patients. Providers can also avoid subconscious biases by undergoing educational trainings on how to provide drug treatments for patients with substance use disorders. It is important to note that not all providers in rural areas have biases towards substance users.

Provider biases are not the only biases that prevent PWID and individuals with HCV from receiving care. Patients themselves often have biases that are influenced by misinformation or assumptions. Although being uninsured is a barrier to treatment, patient assistant programs funded by federally qualified health centers (FQHC) help to reduce copays to as little as $5 to $25 (J. Tompkins, personal communication, October 30, 2019). Although this is a reduction, this amount may still cause a barrier to care for those who can still not afford the reduced amount.

The inability to afford transportation to treatment services can be avoided in some areas if the area has FQHC that offers transportation services. Crawford County does not have a FQHC that offers patient assistant programs or transportation services (J. Tompkins, personal communication, October 30, 2019). Meadville Medical Center offers transportation services to its patients, but that does not benefit the individuals seeking harm reduction or treatment services somewhere outside of the Meadville Medical Center (J. Tompkins, personal communication, October 30, 2019). All of the current rural clinics offer a sliding fee for uninsured individuals when it comes to HCV treatment. This may be beneficial for some uninsured individuals; however, any fee is a barrier to treatment to those individuals with HCV that cannot afford it.

Many individuals with HCV fear that pursuing treatment will actually make them feel ill. This fear originated from the previous IFN treatment method, which usually resulted in severe

side effects for the patients including worsening hepatitis symptoms, anxiety, severe depression, dry mouth, excess fatigue, headache, mood changes, and weight loss (Banerjee and Reddy, 2016). However, with the current treatment regimen a cure is attainable by administering 1 to 3 doses per day, typically for 8 to 12 weeks and with very minimal side effects (Banerjee and Reddy, 2016). The current treatment regimen is most commonly Vosevi, Zepatier, or Mavyret, medications that can treat all HCV genotypes (FDA, 2019). With this treatment regimen, less than 20% of patients suffer from very mild side effects, most often a mild headache with a very small chance of more moderate to severe side effects such as anemia, (WHO, 2017).

The patient's fear of potentially having a liver biopsy is also a misplaced fear as liver biopsies are not conducted to test for or diagnose HCV. Many patients also feel limited in the choices that they have. If a PWID is not ready to stop using drugs, they may not seek HCV treatment services because they are unaware that treatment can be started while they are still using drugs (Banerjee and Reddy, 2016). Many of these common misplaced fears and misconceptions could be resolved with providers and other HCW providing better information and education to the community and to their patients.

When consulting with a preventative health specialist in Crawford County, it was indicated the biggest challenges that they see in terms of opioid use and HCV screening and treatment were surrounding high poverty rates and stigma resulting in barriers to care (J. Tompkins, personal communication, October 30, 2019). Preventative health specialists claimed that many individuals living in Crawford County have the traditional "pull them up by the bootstraps" approach on opioid treatment. To "pull up by the bootstraps" means "to succeed or elevate yourself without any help" (The Huffington Post, 2019). They also noted that although there are currently options for effective treatment services available, they are difficult to

navigate. This is the same challenge that many individuals face with the follow-ups from the physician offing telehealth services in a neighboring county. Individuals are not always able to find transportation to the office for follow-ups if they test positive for HCV and when this happens there is a lack of follow-up to treatment and counseling services with healthcare providers located in Crawford County (J. Tompkins, personal communication, October 30, 2019).

4.2 Opportunities for Improvement in Crawford County

Healthcare worker's lack of training regarding opioid use disorder treatment influencing their referral decision making is an opportunity for improvement in Crawford County. Healthcare workers following the recommendations outlined by the prescribing and distributing opioids guidelines as well the DHHS proposed implementations for HCV prevention and treatment have the potential to hinder individuals with substance use disorders to gain access to opioids (CDC, 2018).

Crawford County is lacking a co-located treatment center for substance use disorder and HCV prevention and treatment services, including MAT, detox and rehabilitation services, education, counseling, free HCV testing, and HCV treatment. Although some of these services exist in separate facilities, there is a severe lack of free or discounted transportation services to the facilities (J. Tompkins, personal communication, October 30, 2019). The lack of free HCV testing services is a major barrier to HCV diagnosis among uninsured and underinsured substance users in Crawford County. The cost of an HCV antibody test ranges from $10 to $30 and the cost of an HCV RNA test ranges from $50 to $100 (Barocas et al., 2018).

The lack of access to treatment is a substantial issue in Crawford County, whether due to high cost of treatment, lack of insurance, geographical distance, and/or lack of available specialists. Introducing a FQHC that can offer patient assistance for HCV treatment, free HCV screening, and transportation services would be an important benefit to the residents of rural Crawford County.

4.3 Recommendations

4.3.1 Medication-Assisted Treatment and Needle and Syringe Programs

4.3.1.1 Medication-Assisted Treatment Programs

To eliminate the transmission of HCV it is essential to reduce injection opioid use rates. Thus, more injection opioid use harm reduction efforts need to be implemented in Crawford County. The implementation of MAT programs is one way to help PWID control addiction and stop using injection as a method of drug use, lessening their odds of contracting HCV (Sordo, 2017). Currently, Crawford County has two facilities that offer methadone treatment services, Mercy House and Greenfield Counseling. However, both of these organizations are in Meadville. This reiterates the barrier to care for individuals that do not have a means of transportation from the rural areas in Crawford County to Meadville.

Opening more MAT programs in rural areas would give PWID in those areas access to a form of treatment they otherwise may not be able to access. There is a major absence of MAT programs as well as providers who are legally permitted to treat patients with opioid substation medications in rural counties (CDC, 2018). As of 2016, 52.5% of counties in the US had at least

one provider legally able to administer MAT, and 60.1% of rural counties in the US still do not have a single provider permitted to administer MAT (CDC, 2018).

MAT programs have been proven to reduce the number and the severity in relapses due to opioid use, while also lowering the rates of criminal activity and incarceration for drug-related crimes (Moore et al., 2019). Even though Crawford County has two treatment centers that offer methadone treatment, the expansion of MAT programs could potentially provide individuals living outside of Meadville access to a treatment service they otherwise may not be able to access.

4.3.1.2 Needle and Syringe Programs

In order to reduce injection opioid rates, it is essential that PWID have access to clean needles and syringes. Needle and syringe programs (NSP) provide PWID with sterile syringes and other equipment to reduce the risks associated with sharing injection equipment (Sawangjit, Khan, and Chaiyakunapruk, 2017). There are no NSPs in Crawford County and it is a barrier for PWID to travel to either Pittsburgh or Cleveland to access one of the NSPs. Even though the CCDAEC stationed two syringe disposal boxes throughout the county, this opportunity does not give PWID access to new drug injecting supplies. Research has consistently shown that NSPs participants are less likely to engage in high-risk behaviors that can transmit bloodborne pathogens such as HCV (Sawangjit, Khan, and Chaiyakunapruk, 2017). With the implementation and utilization of NSPs, the presence of HCV would decrease among individuals with injection substance use disorders. (Lazarus et al, 2018).

Most NSPs provide access to clean syringes and needles, as well as education and counseling services to PWID about HCV risks and preventative measures and link them to HCV screening, diagnosis, and treatment centers. They also facilitate where PWID can obtain

vaccinations for other forms of hepatitis as well as substance use treatment services (Lazarus et al, 2018). Offering integrative care services such as education, counseling, and referral services at NSPs is an influential strategy to simultaneously combat comorbidities, such as alcohol use disorders and psychiatric disorders, that are barriers to care in PWID (Bruggmann and Litwin, 2013). Education is one of the most important harm reduction efforts that is currently lacking in Crawford County. Educating patients, healthcare providers and the community is a critical future direction because misplaced fear will cause individuals not to seek treatment and implementing educational services at NSPs is one of the best ways to reach the target population since they will already be at the facility receiving other services (Jost et al., 2019).

Not only do NSP programs have public health significance, but they are cost effective. NSPs have been found to be the least expensive avenue of harm reduction. In the United States NSPs range from $23 to $71 per person each year (Sordo, 2017). This range in cost varies based on region and the delivery system whether it be pharmacies, mobile outreach, etc. (Sordo, 2017).

It is important to recognize that there are also non-viral infections and medical conditions that are associated with continued injection drug use such as collapsed veins, bacterial infections of the heart valves and blood vessels, abscesses, and soft tissues infections (NIH, 2018). Major mental health illnesses such as depression, anxiety, and personality disorders are often dually diagnosed with substance use disorders in PWID (Khalsa et al., 2009). Additional substance use disorders such as alcohol, methamphetamines, cocaine, and marijuana are frequently observed among individuals with opioid use disorders (Bruggmann and Litwin, 2013). For this reason, it is important that all MAT programs, NSPs, and any other inpatient or outpatient substance use and misuse treatment facilities offer mental health counseling and education as well as referral services. Since Crawford County currently does not have a single co-located treatment center

where PWID can go for all of their substance use disorder and HCV prevention needs, the implementation of these harm reduction efforts is essential because they will save lives, promote health, human rights, dignity and save the residents money (Burton, Voluse, and Anthony, 2019).

4.3.2 Alternatives to Incarceration for Drug Offenses

As previously indicated, there are limited opportunities for alternatives to incarceration for drug offenses in the state of Pennsylvania. Some substance users serve a jail sentence with no substance use treatment just traditional detoxification and that is an effective means of treatment. However, that approach to treatment does not work in every individual with a substance use disorder that is found guilty of a drug related offense. Providing the opportunity for alternatives to incarceration for drug offenses would be a beneficial policy change for PWID in Crawford County.

Problem-solving courts in Venango County, Pennsylvania offer alternatives to incarceration for drug offenses. Their mission is to "enhance public safety by reducing criminal activity and assist substance abuse to become drug and alcohol free, productive and law-abiding citizens" (Co.venango.pa.us, n.d.). This court offers mandatory substance use disorder treatment, with frequent appearances in front of a judge, weekly contact with supervisors, frequent case management meetings, and frequent counseling sessions and support groups (Co.venango.pa.us, n.d.). The eligibility of a convicted substance user to participate in the program is determined on a case-by-case basis. Factors such as current criminal offense, past criminal offenses, and community safety are considered when determining eligibility (Co.venango.pa.us, n.d.). Implementing similar problem-solving courts in Crawford County would be beneficial by providing eligible substance users a chance at a potentially beneficial treatment strategy.

Even if an individual is convicted of an illicit drug-related crime and they do not receive a jail sentence, they receive a considerable fine which many substance users cannot afford to pay (NIDA, 2014). If they do not pay said fines, they must serve jail time. Implementing a policy change that allows for alternatives to incarceration for drug offenses would decrease the rate of relapse which is not only beneficial for the individual but is also beneficial to taxpayers, due to reduced costs for incarceration (NIDA, 2014).

4.3.3 Additional Funding for At-Risk Counties

Governor Tom Wolf made progress addressing the opioid epidemic by investing $108.3 M of the Pennsylvania budget towards initiatives that combat opioid use ("Pa Tightens Medication Rules to Help Combat Opioid Crisis", 2017). However, none of the money went to initiatives specifically for rural areas of Pennsylvania. 45 million dollars went to the continuation of funding services to address heroin and opioid addiction through the Single County Authorities, but research consistently shows that rural areas face healthcare disparities that urban areas do not (Meit and Knudson, 2017). Additional funding in the budget should be allocated to at-risk rural counties in Pennsylvania, such as the counties listed on the CDC's most vulnerable to widespread transmission of HIV and/or HCV infection among PWID. Due to Crawford County's burden of opioid use and misuse, advocacy for additional funding by government officials is essential. Crawford County is at a great need for improved harm reduction and treatment resources, thus the Pennsylvania DOH and DDAP should designate supplementary funding for these services.

4.3.4 Transportation and Cost of Treatment

Transportation to treatment centers and cost of HCV medication are two of the most considerable barriers to HCV care in Crawford County. The development and funding of a FQHC in Crawford County could reduce these barriers. Other FQHC in Pennsylvania offer patient assistance programs to help pay for HCV medication and transportation services to and from treatment. Even without the implementation of a FQHC, a plan needs to be contrived to solve the transportation issue in Crawford County. The expansion of public transportation by extending bus routes to rural areas would be an efficient way to give the residents of rural areas access to the harm reduction programs that are already operating.

4.3.5 Training of Healthcare Professionals and Teams

The education and training of all healthcare providers and their teams are essential to ensure the most accurate and efficient approaches to treatment of substance use and misuse are being implemented. Providers and their teams should be trained on current effective substance use treatment medications, protocols for their use, effectiveness of support services, harm reduction, and NSP efficacy. They also need to be provided with information on where to obtain clinical consultation on MAT, such as the National Clinical Consultation Center (NCCC). Providers and their teams also need training on the most up-to-date and effective screening and treatment approaches such as motivational interviewing, SBIRT, MAT, detoxification, individual and group counseling, 12 step programs, and rehabilitation programs.

Education and training can be achieved by providers and their teams collaborating with specialists in the area to get more information or contact organizations that offer education services such as the MidAtlantic AIDS Education and Training Center at the University of

Pittsburgh. Healthcare workers can also undergo trainings via telecommunication offered through the University of Pittsburgh Medical Center hospitals. Assuring all healthcare providers and their teams have access to the necessary trainings and information is critical because education can change stigma in healthcare settings and communities.

4.4 Future Directions in Crawford County

Although implementing all of the recommendations for policy change would be a public health improvement, the implementation of policy reform is not always feasible and would take a substantial amount of time and resources. However, simpler, more time efficient changes can be conducted in the meantime.

It is important for healthcare providers to understand the patient's life circumstances and challenges (Figure 7). There are many common misconceptions and fears that PWID have regarding medical care. Most patients know that injecting drugs is unhealthy, so physicians need to obtain training on motivational interviewing and other techniques to facilitate open, honest exchanges with their patients who have substance use disorders. Such approaches encourage patients to feel accepted and increases their trust of providers and healthcare systems (Carusone et al. 2019).

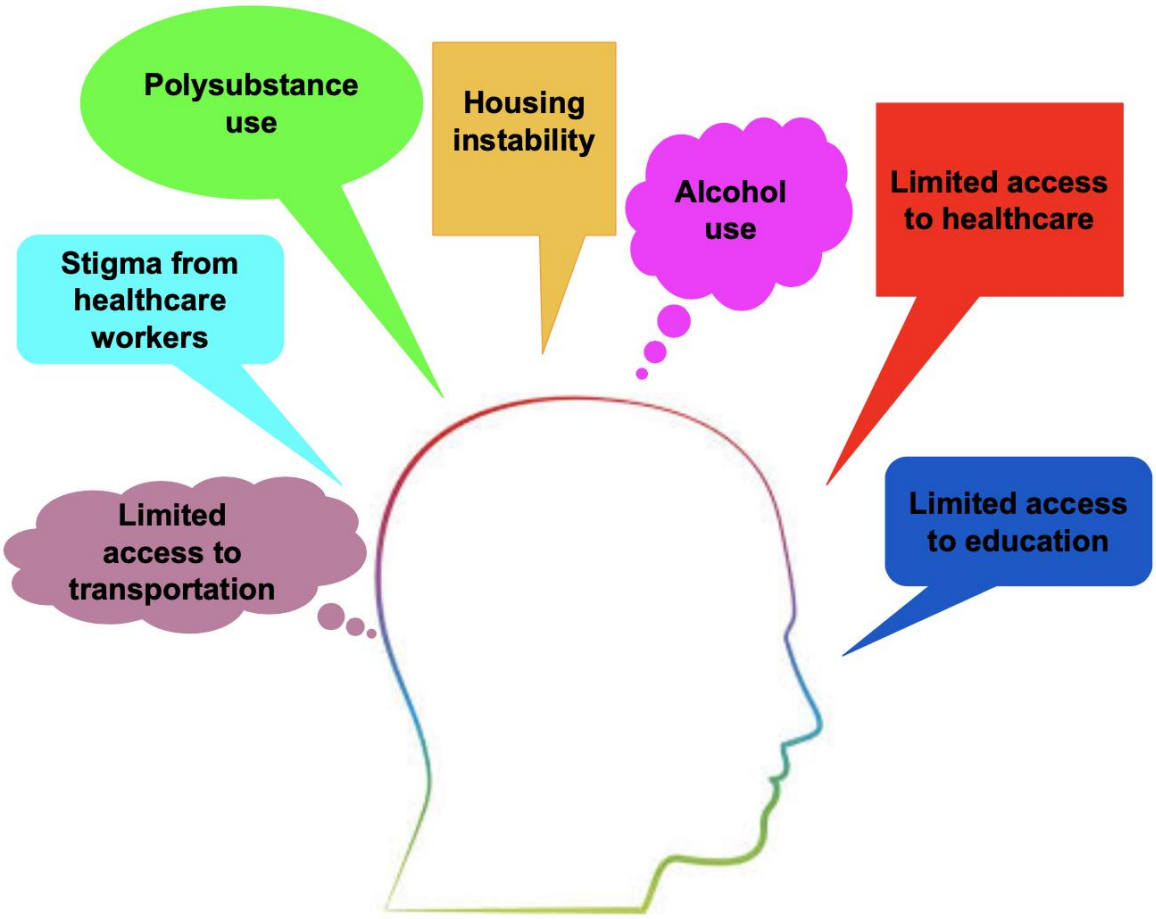


Figure 7. The Patient's Life Circumstances and Challenges
Common fears and misconceptions that PWID associated with different challenges they experience during drug use

As indicated by the personal communication with preventative health specialists navigating the existing prevention and treatment programs and services in Crawford County is difficult. Informational materials, such as pamphlets on topics such as HCV and other infectious disease transmission prevention and treatment, mental health, substance use treatment, and sexual and gender minority health could be presented to patients at their medical appointments to provide education. Education about existing substance use prevention and treatment could also be announced through print media, local news outlets and community forums.

Community forums could be held at local public facilities to provide educational information about substance use treatment services and harm reduction efforts that are available locally. They could also education the community on common misconceptions about substance use and HCV treatment services to raise awareness and encourage advocacy. Forums could also offer trainings for the community, such as naloxone administration trainings. Community forums would be an influential mechanism to engage community members in open, informative conversations that could decrease some of the stigma surrounding substance use and misuse and related behaviors.

Allegheny College and the University of Pittsburgh at Titusville are both located in Crawford County. If preventative health specialists and healthcare providers created partnerships with the local colleges they could host community forums and engage students in the promotion of public health awareness of the opioid epidemic and high HCV rates. By providing substance use education resources, students may be prompted to volunteer at local community-based organizations and lobby for policy changes.

The SBIRT approach that is outlined in the opioid prescribing guidelines, was developed for health providers to effectively motivate patients to change patterns of substance use to prevent and reduce public health concerns (Hargraves, White, Frederick et al., 2017). Providers in every healthcare setting should utilize SBIRT at every encounter. This is a minor, but extremely effective approach that should be implemented in Crawford County because it aids in ensuring no patient is overlooked and every patient in need is connected to the appropriate treatment.

As previously indicated, all firefighter and police departments in Crawford County are able to carry naloxone however, some departments choose not to carry it (J. Tompkins, personal

communication, October 30, 2019). If all first responder departments had access to naloxone to administer, this would be a simple change that has lifesaving benefits. These recommendations can be effective and offer implications for ongoing change in policy in Crawford County. If these small changes prove successful, they may influence the implementation of the more complex policy changes in the future.

4.5 Limitations of Recommendations

MAT is proven to be an effective treatment for individuals struggling with opioid use disorders, however there are some limitation to expanding MAT programs to rural counties. In order for providers to be legally permitted to treat patients with opioid substitution medication they must have a waiver from the DEA. Once providers have received the waiver, they are able to treat 30 patients within their first year of having the waiver and 100 patients after their first year (CDC, 2018). However, many physicians who are legally permitted to treat patients with MAT do not treat the maximum number of patients they are permitted to treat (CDC, 2018). Any healthcare physician can apply for a waiver, however many do not. Many rural providers indicated barriers that hinder them from applying as lack of time, absence of available mental health counseling and education services for the individuals who would be undergoing the MAT treatment, providers resistance, and the providers feeling as though they are unable to appropriately manage patients' opioid addictions (CDC, 2018).

Although NSPs are extremely effective harm reduction programs that have growing support for legalization, they are technically illegal in the state of Pennsylvania (Davis et al., 2019). NSPs are only available in Pittsburgh and Philadelphia because the county governments

declared drug overdoses as a public health emergency. There have been ongoing efforts and petitions to legalize NSPs throughout the entire state. It has been an effort for many years to achieve policy change in these larger cities which will be difficult and will take time.

Individual opinions of whether NSPs should be legalized vary widely. Often residents of the communities where NSPs may be implemented feel as though crime and the number of PWID will increase with the implementation of NSPs in their community (Duplessy and Reynaud, 2014). In addition, resources are required before the installation of NSPs. These resources include individuals to volunteer their time to work at the facilities, trained professionals to administer outreach and education services as well as administer Naloxone, and facilities to house programs. NSPs require fiscal resources to implement so acquisition of funding to open and sustain these programs is essential. Programs also need to have collaborative relationships established with specialty clinical and support services at can be utilized for referrals.

Other stakeholder engagement is also a major barrier in terms of implementing NSPs in terms of funding. It is illegal to use local, state or federal government funds to finance these programs, thus the programs have to find outside grant funding (Suryaprasad, 2014). Local political figures may not support the instillation of NSPs, which can negatively influence the opinions of the communities.

Even if every policy change recommendation is implemented, stigma remains a barrier to care for individuals with substance use disorders in Crawford County. It is crucial for healthcare workers, families, patients and communities have knowledge that substance use is a chronic disease that can be successfully treated with medication and/or other treatment approaches just like heart disease, chronic obstructive pulmonary disease or any other chronic illness.

5.0 Conclusion

The transmission of HCV and the increased opioid use rates are two intertwined endemics. This essay has discussed the relationship between opioid use rates and HCV prevalence in rural Pennsylvania, specifically in Crawford County, identified current treatment for opioids and HCV in Crawford County, identified current policy related to opioids in Crawford County, and made recommendations for policy improvements in Crawford County, Pennsylvania.

To decrease the rate of HCV transmission in Crawford County the rate of injection drug use requires intervention. Currently policies in place are making strides in the right direction to reduce HCV transmission from injection drug use. The opioid prescribing and distributing guidelines, the implementations of Pennsylvania's PDMP, the DHHS action plan on HCV treatment and prevention, the bills Governor Tom Wolf signed into law and the portion of the Pennsylvania budget that was distributed to address the opioid epidemic are all valuable and progressive.

Although changes are taking place, there are still challenges in Pennsylvania's rural areas that need to be addressed. The continued implementation of guidelines is essential in the reduction of HCV prevalence due to opioid rates in Crawford County. The additional allocation of resources to at-risk counties such as Crawford County would aid in the development of new initiatives to improve harm reduction and treatment services. It is essential to provide adequate educational and training services to providers, substance users, families of substance users and the community. Providing training services to providers will aid in ensuring that patients with substance use disorders and HCV are being treated with the appropriate recommendations.

Finally, the expansion and development of new programs in Crawford County would assist in the reduction of HCV transmission due to substance use. The development of NSPs, the expansion of MAT programs, along with providing opportunities for alternatives to incarceration for drug offenses are crucial in diminishing the opioid epidemic in Crawford County.

Even with new treatment options available to cure HCV, stigma surrounding substance use will continue to be a major barrier to substance use disorder and HCV treatment in Crawford County. Every individual with HCV needs to be treated and cured of HCV and provided with access to resources to reduce HCV risk through effective methods of drug treatment and which current policy should reflect.

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